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ENVIRONMENTAL IMPACT STATEMENT ON THE PROPOSED PLYWOOD MANUFACTURING PLANT AT BONNER, MONTANA

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Air Quality Bureau

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Department of Health and Environmental Sciences
STATE OF MONTANA HELENA, MONTANA 59601

John S. Anderson M.D.
DIRECTOR

April 30, 1973

Gentlemen:

The enclosed final environmental impact statement is submitted for your review and comment. This statement is the cumulative result of the draft statement, additional information, and comments to the draft. The statement concerns a proposed plywood manufacturing facility to be constructed at Bonner, Montana, by U. S. Plywood-Champion International.

The Montana Environmental Policy Act of 1971 provides that at least 30 days must elapse after submission of the final statement before action can be taken. If, at the end of this period, no significant additional information to the contrary is presented, the permit will be granted subject to the conditions contained in Appendix B of this report.

Also enclosed is a list of those persons and agencies receiving a copy of this statement.

Sincerely,

Donald R. Holtz

Donald R. Holtz, Chief
Air Quality Bureau

DRH:JNB:mrc

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SUMMARY

The Montana State Department of Health and Environmental Sciences, Air Quality Bureau, is considering a construction permit application submitted by U. S. Plywood-Champion International. The applicant has requested permission to construct and operate a plywood manufacturing facility at Bonner, Montana. In accordance with the Montana Environmental Policy Act of 1971, this final environmental impact statement has been prepared to assess the effects of this plant on the environment. The draft Environmental Impact Statement has been circulated and comments have been received. This statement, in addition to information presented in the draft, contains more recent data, the comments received, and responses to those comments.

This facility will process logs by peeling them for veneer and gluing the veneer together to make plywood. Timber cut will be increased over the previous owner's operations. Sewage treatment will be provided where necessary and no water will discharge to the river from the plywood plant and total discharge will be reduced. Emissions are generated in the process of sanding and sawing and veneer drying, in addition to existing sources. Control of emissions will be provided.

This facility will generate solid and liquid particulate matter as well as gaseous hydrocarbons. No adverse effects are expected from solid particulate. The hydrocarbons emitted from the veneer dryers are not particularly toxic to man or other elements of the environment. However, the liquid (condensable) hydrocarbons are evaluated as particulate matter. As particulate matter, these hydrocarbons will cause some visibility reduction and increases in suspended particulate concentrations. Total emissions will be considerably reduced over past years and probably will result in a net improvement in the air quality.

Dispersion modeling indicates that emissions from the proposed dryers will not exceed standards or cause any to be exceeded. Sampling is being done and the program will be further expanded, including more research on the area's meteorology. Water emissions have a potential effect on the weather of the area. The permit will be approved subject to several conditions.

Alternatives to the proposal considered in this statement are: Not building the plant, altering the size of the plant, locating the plant elsewhere, and different methods of emission control.

No long term adverse effects on air quality are expected, though timber usage may have effects extending beyond this plant's operational life. Economic benefits and adverse environmental effects occur simultaneously, and the adverse effects (short-term) are expected to be minimal.

Summary of Statistics of Bonner Plant

Location	Bonner, Montana, 5 miles east of Missoula Sections 21 and 22, Township 13 North, Range 18 West
Elevation	3360 feet (MSL)
Ownership	U. S. Plywood-Champion International
Operation	Same
Scheduled Completion	March, 1974
Total Cost	In excess of $15,000,000
Plywood Production	300 million square feet annually (3/8" basis)
Timber Cut	212 million board feet annually 120 MMBF to plywood 92 MMBF to sawmill
Electrical Consumption	Approximately 7,500 KW
Veneer Dryers	Coe Manufacturing, Vert-i-Jet Type 5 dryers, 104 sections total 1 each 12 section - 3 zone 18 section - 3 zone 22 section - 4 zone 24 section - 4 zone 28 section - 4 zone
Water Consumption	970 GPM
Discharge to River	414 GPM (Max)

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Appendix C - Comments and Responses to Comments

I. INTRODUCTION

U. S. Plywood-Champion International intends to construct and operate a plywood manufacturing facility at Bonner, Montana. This report is an analysis of the environmental impacts that will be caused by the construction and operation of this facility. This facility will be a new source in the sense that it is a new type of operation. Portions of the existing facility are being discontinued. Emission control systems will be installed on the necessary equipment.

Manufacturing plywood is not a particularly complex operation, and what follows is a synopsis of the procedure. Logs sawed in the woods are transported to Bonner by truck or rail, debarked, and cut into lengths. Thin sheets or veneers are peeled off the logs by long knives and processed through dryers to drive off the moisture. The veneers are then taken to presses where they are glued and formed into sheets of varying thicknesses and numbers of veneers per sheet. They are then sawed to size, usually 4 x 8 feet, and possibly sanded.

There are several sources of emissions in a plywood plant. The veneer dryers pose the most difficult problem for emission control. The temperatures in the veneer dryers (270-280°F) are high enough to volatilize certain hydrocarbons contained in the wood. These hydrocarbons are emitted into the atmosphere through stacks on the roofs of the buildings, resulting in the blue haze seen in the area of many plywood mills. The applicant intends to control these emissions by using low temperature drying with provisions for additional control if necessary. Emissions are also generated in the processes of sanding and sawing; in this case. U. S. Plywood will install bag filter collectors to control these emissions.

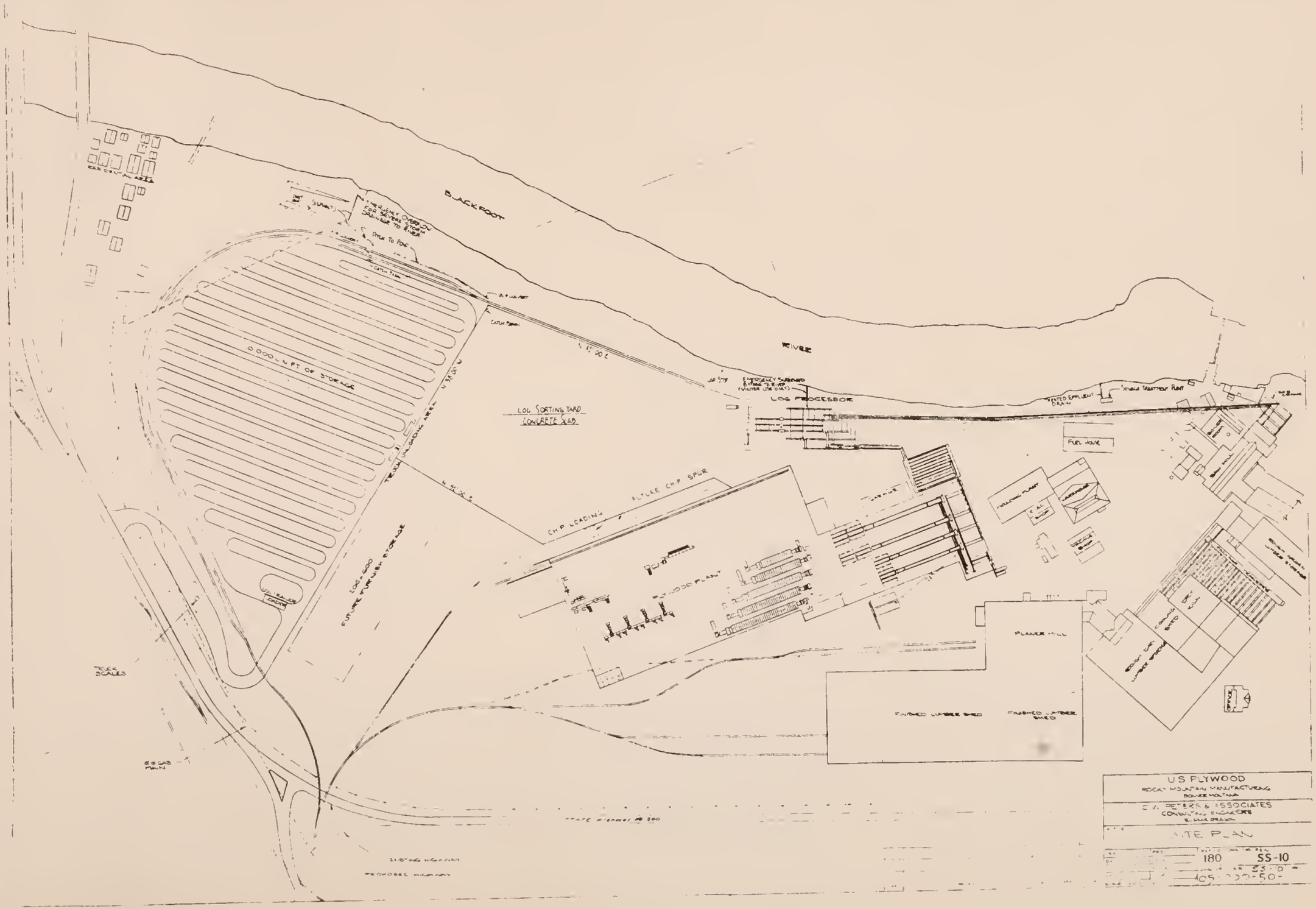
II. DESCRIPTION OF PROPOSED FACILITY

A. Plant and Process

Logs are sawn in the woods and transported by trucks and rail to the facility in Bonner. Under the previous owner, Anaconda Forest Products, timber cut for the saw mill as it operated ranged from 140-180 MMBF per year. Total cut under U. S. Plywood's operation will increase to 212 MMBF per year. Of this 212, 120 MMBF will be used for manufacture of plywood; the remaining 92 will be processed through the sawmilling portion. Presently, it is expected that 100 trucks will enter the plant carrying logs and 60 rail cars will enter each day. Approximately 60 trucks and 20 rail cars will leave the plant carrying finished products. Another 10 trucks per day will pass through the plant with miscellaneous loads. Trucks will be unloaded in the Bonner yard and logs will be handled on a concrete slab before taken for sorting. Figure I is a site plan of the facility.

Logs in the yard are held in storage under sprinklers to control stain and checking, and water is recirculated through the sprinklers to prevent discharge to the river; however, evaporative losses and absorption necessitate makeup. A concrete sump will be provided for water drainage from the sprinkler system and there will be no discharge to the river. Logs will then be sorted and sawn to the proper length for sawmilling or plywood use and debarked. The bark will be conveyed to the existing boiler for use as fuel. No emissions are generated in the debarking process.

The logs chosen for plywood manufacturing will then be conveyed to hot water vats, where they will be held for about 24 hours (not 2½, as in the draft statement) to soften the wood for better peeling mechanics and veneer quality. This is also expected to reduce the amount of loose wood fiber on the surface of the veneer and prevent its future entrainment in stack gas emissions from veneer dryers. The hot water vats will be concrete structures filled with steam-heated water, and will be roofed to minimize the fog which would otherwise be present near the water surface during cold weather.


BLACKFOOT
RIVER
LOG SORTING YARD
CONCRETE SLAB
LOG PROCESSOR
FUEL HOUSE
CHIP LOADING
FUTURE CHIP SPUR
PLANER MILL
FINISHED LUMBER SHED
FINISHED LUMBER SHED
US PLYWOOD
ROCKY MOUNTAIN MANUFACTURING
PONDER MONTANA
C.V. PETERS & ASSOCIATES
CONSULTING ENGINEERS
SITE PLAN
180
SS-10

A certain amount of vaporization will occur; however, this is expected to be minimal. The hot water system will also require makeup due to absorption by the wood and a certain amount of evaporation. The waste water will be re-used as makeup for the sprinkler system and solid waste from the clean up will be used as boiler fuel.

Logs are conveyed to the veneer lathes where they are peeled to remove the sheets of wood as veneer, ranging in thickness from 1/10" to 3/16". The remainder of the logs (cores about 5½" in diameter) are delivered to a Chip-N-Saw where studs and chips are made. The sawdust from this unit will be used as fuel in the boiler. The veneer is then conveyed to clippers where it is cut to sizes suitable for processing through the dryers and sorted according to grade, moisture content and veneer thickness. There will be three moisture sorts, four thickness sorts, and grade sorts. These sorts are performed for a variety of reasons, including better control over the dryers due to the variables involved in processing of veneer, to obtain better quality veneer and also to segregate it according to desired products.

The waste veneer and the waste from the clippers are conveyed, along with broken core blocks from the lathes, to a chipper. These chips and those from the Chip-N-Saw unit will be conveyed to a rail car load-out.

The veneer dryer is a major source of emission in a plywood plant. The veneer dryers reduce the H_2O content of the veneer from 50-200% (dry basis) to 8-12% (dry basis) and in the process generate emissions. Temperatures inside the veneer dryers will average about 275°F, not ranging from 350° to 270° as stated in the draft statement. The five dryers will be divided into several zones. These zones, which are composed of modules known as sections, will be regulated for temperature and heat input. The 12 and 18 section dryers will have 3 zones each and the 22, 24, and 28 section dryers will each have 4 zones. Each of the various zones can be maintained at a temperature independent of the other zones. This will allow the operators to run the dryers in the manner which produces the least emission and still maintain the desired throughput.

Temperatures inside the dryers are still sufficiently high to volatilize or vaporize certain hydrocarbons contained in the wood. U. S. Plywood intends to control these emissions by use of low-temperature dryers. Control of dryer emissions is discussed in later sections, but the state presently believes this will be an acceptable means.

The veneer dryers will be of the jet type, which is a fairly recent innovation in veneer drying. These jet dryers make use of steam coils to heat air, which is then forced at a high velocity through nozzles on the veneer. The hot air provides the necessary temperature to drive off the moisture contained in the wood and also entrains some loose wood fiber in the veneer surface.

The veneer is then conveyed to veneer processing machines where it is patched, sawed in certain cases, jointed or edge glued. Pieces of veneer are then glued together for pressing. The glue is formulated by the blending of solid and liquid materials in equipment consisting of storage tanks, pumps, use tanks, mixing tanks, scales for proportioning ingredients, etc. A phenolic resin glue will be used, obtained by bid. The water from washdown of this equipment is used as part of the glue formulation so none of this will be discharged to the river. The gluing machine has rolls which apply glue to both surfaces of the cross cores of the plywood simultaneously and to one side only of the face cores. The glued material is then handled manually and arranged for the presses. Laid-up plywood is then introduced into the steam-heated presses where it remains for 4½ minutes, under pressure of 200 PSI heated by 150 PSIG steam.

The constructed plywood is then sanded and sawed depending on its quality and also use. Saw trim and other waste will be hogged and used for fuel in the boiler. A certain amount of dust is generated in the sawing and sanding of the product. Dust will be controlled with a system utilizing bag filter separators. The finished plywood is then conveyed to a rail car or truck loadout facility. Figure II shows a schematic flow diagram of the veneer or plywood manufacturing process.

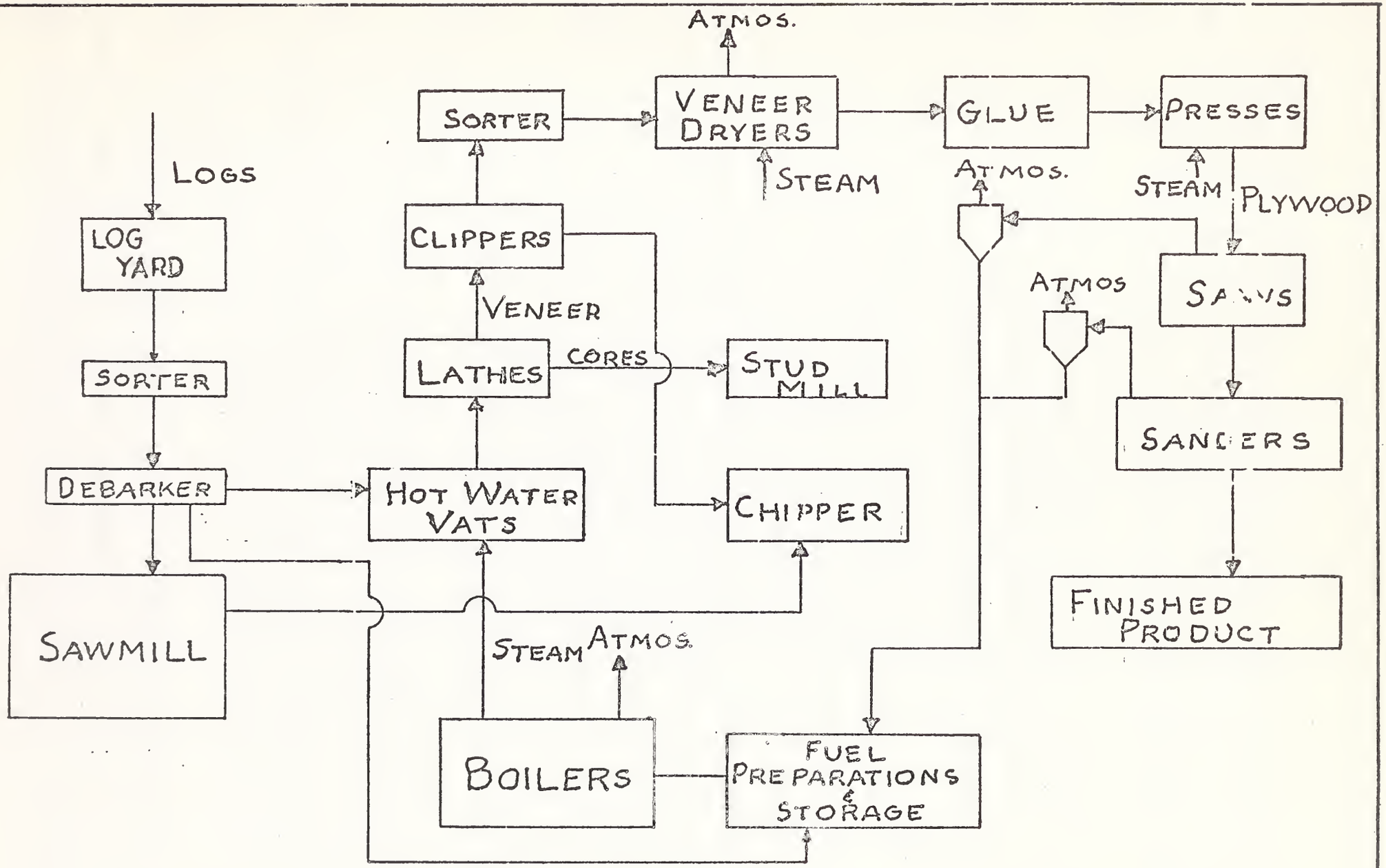


FIGURE II

SCHEMATIC FLOW DIAGRAM

J. BOLSTAD

B. Emissions Control Systems

The veneer dryers, as previously mentioned, pose the most difficult problem for emission control. Both solid and liquid particulate matter are emitted from veneer dryers. The applicant intends to control this liquid particulate with a low-temperature drying system.

This particulate (condensed hydrocarbons) is generated by volatilization of certain organic compounds contained in the wood and the quantities generated are a function of temperatures and type and amount of compound in the wood. The applicant will install veneer dryers which operate at a considerably lower temperature than conventional dryers on the theory that lower temperatures will result in lesser emissions.

This type of control, if successful, would be the most desirable type from an environmental standpoint. If an acceptable emission level can be reached in this manner, no secondary treatment would be necessary. This system is simple and eliminates many of the maintenance problems that occur with secondary systems. No additional disposal problem, solid, liquid, or gaseous, is created. Energy requirements appear to be somewhat lower, in total, for the low temperature system than for others.

Testing indicates that this approach is a viable solution to the condensable HC emission problem associated with veneer dryers. Some results of this testing are discussed in Section IV, A, 2.

Early tests of dryer emissions indicated that solid particulate was essentially absent from the stack gas. Recent tests indicated the presence of a considerable amount. Our experiences indicate the prior testing is more valid of veneer dryers in general. In any case, U. S. Plywood is taking steps to minimize this problem with the log soaking process.

The pneumatic conveying systems, such as the sander dust control and relay systems, dry sawdust systems and dry planer shaving systems, will have control equipment of the Carter-Day type CS design (bag filter collector) or equivalent. The systems will utilize

high pressure air to minimize the air volume handled. These control devices have proven quite successful in similar situations.

There are other sources which will be eliminated or their emissions reduced. The entire active log storage area and all roads which receive truck travel will be paved, cleaned regularly, and watered during summer. The small log mill is being phased out. Other operations which have been discontinued are the Products Plant (beams, trusses and houses) and the Factory Plant (mouldings and finger-jointed stock). These two plants had a total of 10 cyclones which contributed to particulate emissions.

Three dutch oven boilers will be started and will add to the particulate load from the plant. However, the fuel handling system will be extensively modified and will result in improved combustion, as will they also be operated at lower loads than previously. The emissions from the suspension-fired boiler are controlled with a water scrubber.

Other possibilities of emission control were considered, especially in regard to veneer dryers. These are discussed in the Alternative Section.

III. EMISSIONS AND THEIR EFFECTS

A. Emissions

1. Solid Particulates

Wood Fiber - One form of solid particulate that will be generated here is wood fibers. New sources of this will be the saws, sanders and veneer dryers. Existing sources include the planing mill, small log mill, and fuel (wood-waste) handling systems.

The pneumatic conveying systems for sawdust and sanderdust in the new plant and for dry planer shavings in the existing plant will be provided with bag filter collectors. These devices are quite efficient (99.99%+) especially on material such as wood fibers. Efficiencies of 99.99921% (wt) on particles of dust dispersion finer than 5-micron mass median size have been documented. Emissions from these sources will be negligible, probably less than 1 #/hr.

The amount of solid particulate emitted from the veneer dryers is highly questionable. Testing conducted by Washington State University (Investigation of Emissions from Plywood Veneer Dryers, March, 1971) showed solid particulate emissions to be no greater than 0.002 grains (gr)/standard cubic foot (SCF) of stack gas. This would result in a total mass emission of 1.2 #/hr for the applicant's dryers. However, the validity of the quantitative results of this study have been seriously questioned. Test results recently received indicated that emissions of wood fibers may be greater than 1/2 the total particulate emissions from veneer dryers, on the order of 0.17 #/1000 Ft^2 of veneer dried (3/8" basis). It is difficult, though, to determine the relative proportion of solid and liquid particulate due to sampling techniques used. The state's experience does not indicate that solid emissions from veneer dryers are as high as the testing of this dryer above indicates (9.6 #/hr). Nevertheless, the above figure was used to determine effects on air quality (Section III,B,3). As has been previously stated, U. S. Plywood will use a new method of log processing to minimize loose wood fiber that might be entrained in stack gas.

Other Solid Particulate - The present wood-fired boiler is another source of solid particulate, even though equipped with a wet scrubber. Emission from this boiler averages 0.065 gr/SCF (test results) which corresponds to a mass emission rate of approximately 54 #/hr of particulate.

When the plywood plant is brought on line, three existing dutch oven boilers (wood-fired) will put into operation. They will be used, in addition to standby gas boilers, to supplement steam supplied by the boiler previously mentioned. These boilers have been used intermittently for some time. Total particulate emissions are estimated to range from 10 to 50 #/hr, depending on load. If and when a particle board plant is built, the applicant intends to construct a boiler, similar in design and size to the existing suspension-fired one, to supply the additional steam demands. It will be equipped with secondary emission control equipment.

Dust emissions from other sources, such as vehicle traffic, log-handling and wind, are difficult to estimate. However, quantities will be drastically reduced over present operations. All travel roads will be paved, as will the active log storage area. The area will be watered during dry summer weather. There will be a graveled auxiliary storage yard which will be used once a year during spring breakup.

Additional particulate control will be gained through fuel storage modifications. The tepee burner presently used to store hogged boiler fuel will be torn down and replaced with a fuel house. Handling procedures will be altered to provide a better fuel mixture for the boiler, resulting in improved combustion.

2. Liquid Particulates

The veneer dryers are the major source of liquid particulates from the proposed plant. (Liquid H_2O not considered a particulate). The liquid particulates are the result of hydrocarbons driven out of the wood during the drying process and condensing as the stack gas cools. The quantity of hydrocarbon emitted is a function of the specific compound and some of its physical properties (i.e., boiling point, vapor pressure curves) and its relative abundance.

For a given compound with boiling point X^oF, if the wood temperature is above X^oF, the compound will be vaporized (given sufficient residence time for heat transfer). If the wood temperature is below X^oF, the compound will be volatilized to the extent dictated by its vapor pressure at that temperature. In either case, if, at a later point, the temperatures drop below the wood temperature, the compound will condense.

The WSU study previously mentioned revealed that hydrocarbons collected in an ice bath were similar to pitch or mixture of residue and oils from the treatment of wood. It appears that a large portion of the condensable fraction is abietic acid. Evidence also indicates the pressure of sesquiterpenes, fatty acids, resin esters, and resin alcohols.

The draft statement presented some testing results from veneer dryers. More recent testing has provided information more appropriate for comparison with the applicant's dryers. The early testing, by the Mid-Willamette Valley Air Pollution Authority, suggested that a value of 2 #/M ft^2 (3/8" basis) was reasonable for conventional steam dryers. At this rate, the dryers proposed for Bonner would emit 109 #/hr. The WSU results have been invalidated. Testing on a modified dryer resulted in emissions ranging from 0.222 to 0.606 #/M ft^2 (3/8" basis). The high value of these tests was used to determine emissions and effects in the draft statement. Recently, testing was performed on a dryer operated to determine the specific effects of temperatures on emission and simulate the conditions of the proposed dryers for Bonner. These test results gave total particulate emissions ranging from 0.3 #/M ft^2 at 265^oF to 0.73 #/M ft^2 at 345^oF. The dryers at Bonner are to be operated at an average temperature of 275^oF. The tested dryer was not equipped with as sophisticated control as the Bonner dryers will be, nor was the process material as carefully segregated as to type of wood, moisture and veneer thickness as the Bonner input will be. The state believes that the Bonner dryers will operate with less emissions than those above.

In addition, the tested dryers operated with little or no visible emission.

3. Gases

According to the WSU Study, the volatile hydrocarbons found in the stack gas emissions from veneer dryers are camphene, Δ^3 carene, isoprene, limonene, myrcene, β phellandrene, α and β pinene, α terpinene, γ terpinene, and α terpinolene.

These compounds are known as hemi- and mono-terpines. Available data suggests that only a few of these compounds are considered toxic. Very little data is available regarding these organic compounds, so this partially explains the paucity of quantitative data regarding their environmental effects. However, threshhold limit values (8-hour occupational exposure levels) have been established for cyclohexene and turpentine, which are somewhat similar in structure to the veneer dryer emissions. The values are 300 and 100 ppm, respectively. Concentrations of the volatile hydrocarbons IN STACK GAS found in the study ranged anywhere from 5 to 748 ppm (hexane). Alpha and beta pinene are recognized to be potentially reactive hydrocarbons. Studies are presently underway to determine the relative reactivities comparing them with ethylene, isobutene, 1-butene, and the like. We are not aware of any indications that persons working occupationally with veneer dryers suffer adverse effects.

4. Water Emissions to the Atmosphere

Although water emissions to the atmosphere are not considered pollutants, concern has been expressed regarding the effects of such emissions. Presently no standards, either emission or ambient, exist for water discharge to the atmosphere.

Data presented in the draft statement apparently was somewhat confusing and hopefully the following information is not. Some of the water taken from the river is lost to the atmosphere. Of the 2110 GPM removed from the river presently, about 1640 GPM is returned. This 470 GPM is lost as follows: losses due to evaporation--335 GPM; underground and surface containment--50 GPM; scrubber makeup--85 GPM. Therefore, approximately 420 GPM (from evaporation and scrubbers) of water from the river is lost to the ambient air. This value will remain constant with plant construction. If a second boiler with scrubbers is constructed, another 85 GPM may be emitted.

The water emissions from the veneer dryers results from moisture contained in the wood. Some of this water is a result of the soaking and sprinkling processes, but most results from the logs as received. The draft statement indicated H_2O emissions from this source to range from 21,000 #/hr to 107,000 #/hr (42 GPM to 214 GPM). Approximately 56,500 #/hr of dry wood will be processed through the dryers at full capacity. Moisture content will range from 0.5 # H_2O/# dry wood to 2.0 # H_2O/# dry wood, averaging less than 1.0 # H_2O/# dry wood. At the average moisture content, about 113 GPM of water will be driven off.

The moisture content of the wood is far more dependent on specie, wood types (heartwood or sapwood) and individual log than on the soaking or sprinkling processes. The water emission rate will, at times, reach the maximum stated, but only for short durations. Also, the water is emitted at an elevated temperature (275°F) as a vapor.

The 450 GPM removed from the river for plywood and particle board manufacture (See Table 5, Sec. III,B,5) leaves the plant in the product, as it is used for glue formulation.

B. Primary Effects

1. Impact on Vegetation

Construction and operation of this manufacturing facility should result in no impact on the vegetation of the area with the exception of that immediately disturbed by the construction of the facility. This would include dust deposited on roadside flora, and a small amount of vegetation disturbed in locating the operations within the confines of the U. S. Plywood premises. As has been previously mentioned, the hydrocarbon emissions are similar to those emitted from a living forest; therefore, it is not expected that any toxic effects will be noticed if the proposal were implemented.

2. Impact on Wildlife

The area immediately affected by this plant has long been a combination of industrial and residential use. Therefore, the increase in industrial activity will have little or no effect on what wildlife remains in the area. A certain amount of wildlife will be displaced in the continuing logging operations. Increased logging will

probably displace more wildlife than previous operations, but this factor is beyond the scope and responsibility of the Air Quality Bureau.

3. Impact on Man

Human health and welfare are considered adequately protected by the federal ambient air quality standards, especially the secondary standards. That these standards are considered adequate is confirmed by the following statement by the Administrator of the Environmental Protection Agency in establishing the national primary and secondary air quality standards:

> "National secondary ambient air quality standards are those which, in the judgement of the Administrator, based on air quality criteria, are requisite to protect the public welfare from any known or anticipated adverse effects associated with the presence of air pollutants in the ambient air."

The state and federal standards for total suspended particulate are given below in Table 1.

TABLE 1
AIR QUALITY STANDARDS

	TIME	
Standard	Annual geom. mean	24-hour average
Federal		
Primary	75 ug/M^3	260[1] ug/M^3
Secondary	60 ug/M^3	150[2] ug/M^3
State	75 ug/M^3	200[2] ug/M^3

1. Maximum concentration not to be exceeded more than once a year.
2. Maximum concentration not to be exceeded more than 1% of days in the year.

A small amount of air quality data are available for the Bonner-Milltown area. Since a continuity of data was not obtainable for at least a one-year period at any one site, qualitative judgements can only be made.

The pertinent question needing an answer is: What is the area background value for total suspended particulates? To resolve this problem we consider Table 2, particulate data for the years 1966-1967 and 1972-1973, as follows:

TABLE 2
TOTAL SUSPENDED PARTICULATE DATA (Monthly Values)

Date \ Site	Bonner Grade School	Forestry Station		250 Yds NE of School	
	*				
1966 Oct	99.1				
Nov	77.0				
Dec	54.2				
1967 Jan	58.8				
Feb	76.2				
Mar	54.2				
Apr	70.8				
May	72.5				
June	122.6				
		*	**		
1972 Sep		29.3	25.2		
Oct		46.1	39.0		
Nov		40.4	36.5		
Dec		25.8	22.8		
1973 Jan		46.8	39.2		
Feb		57.6	54.6		
				*	**
Mar		41.7	38.4	68.7	54.1
24-hour values:					
1973 March 29					225
30					150
April 3					154
4					223
5					385

All values in micrograms per cubic meter
* = Arithmetic Average ** = Geometric Average

The above data were obtained by gravimetric analysis of high-volume sampling filters. The samples were run 24 hours on a daily sequence.

In an attempt to determine ambient levels without the plants' contribution, simultaneous equations were used as shown below:

$X + AY = W$ (for 1966-1967)

$X + BY = Z$ (for 1972-1973)

Let X = Background levels which were assumed to be the same for both periods

Y = Contribution from plant, assuming sources other than the Bonner plant to be constant

W = Nine month particulate average for the school, 1966-1967

Z = Seven month particulate average for the Forestry Station, 1972-1973

A = The ratio of the March, 1972, particulate loadings for loading at the Forestry Station to 250 Yds NE of the School; i.e., 42 divided by 69

B = The ratio of plant emissions 1972 to 1966; i.e., 100 lbs/hr divided by 800 lbs/hr

The factors A and B weight respectively the increase in particulate concentrations in the school area over the Forestry Station and the decrease in emissions at the plant from 1966 to 1972. The values used for plant emissions are, if not exact, a reasonable estimation of the situations.

The resultant background value as determined above is 38 micrograms per cubic meter. This value is expected for the Bonner-Milltown area and is consistent with similar areas.

Table 1 indicates that earlier monthly averages are higher than recent monthly averages and comparison of Tables 1 and 2 indicates that twenty-four hour particulate violations are very possible now and in the future. It must, however, be noted that the recent high 24-hour values have occurred during construction periods at the plant.

Recent monthly geometric averages when cumulated approximate an annual geometric average--these indicate general compliance with the standards. Twenty-four hour readings, however, present a problem, especially since the diffusion modeling applied to the area considered 24-hour time periods. This short-term modeling found air quality to be within the standards. The model results, discussed later, gives high readings at a point where no data is available. Model results for present and past sampling locations are also discussed later in this section.

The problems of high 24-hour values is a result of several factors:

1. Street dust contributes considerably
2. Plant construction will generate significant particulate
3. Some present plant emissions are not completely controlled

Solutions, then, could include joint city-company efforts to pave streets and control area dust, apply water to haul roads used by construction equipment and controlling plant emissions.

Further particulate sampling is and will be carried out through cooperation of the Missoula County Health Department and the State Air Quality Bureau. This sampling effort will provide contiguous data for at least a one-year period at several sites. Several weather stations are also being maintained as a part of this data acquisition system. Data site selection is somewhat empirically determined--wind movements, diffusion modeling, population density and present and future plant location are parameters which determine where particulate and meteorological values should be accrued. Figure III indicates present and future sampling stations. This figure also shows the location of the highest modeling results.

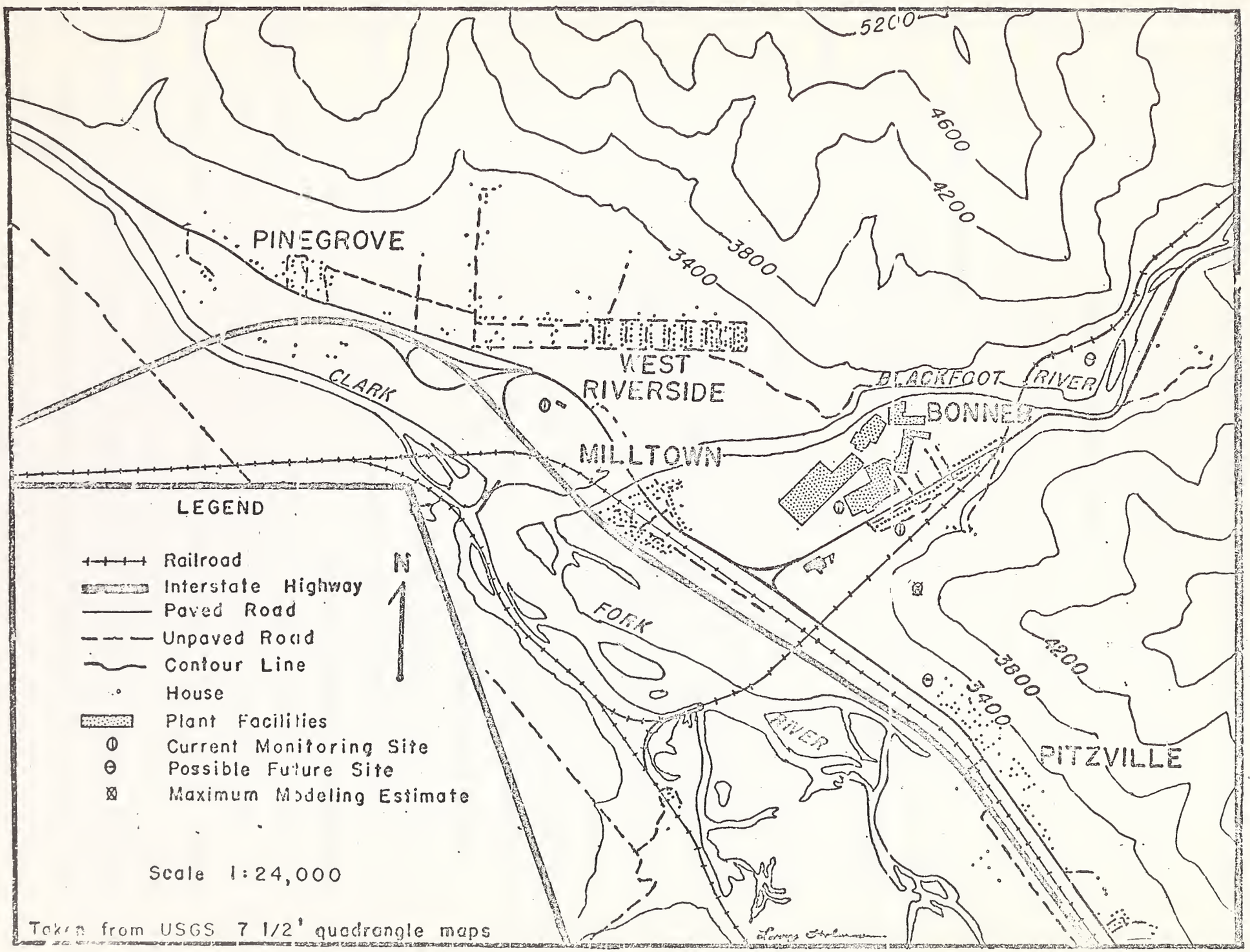
Source testing will be conducted by the U. S. Plywood Company under the state's guidance. The company may also set up, in conjunction with our sampling network, particulate and meteorological stations.

A dispersion model was employed to estimate ambient particulate concentrations in the Bonner area contributed by emissions from the veneer dryers. This technique uses a mathematical model to simulate plume behavior in the atmosphere. Plume rise, plume diffusion, and emission characteristics are determined by such parameters as wind speed and direction, atmospheric stability, inversion heights, heat and mass emission rates, emission temperature and stack height.

A maximum 24-hour concentration was sought from the model. Maximum ground level concentrations will result when the terrain elevation is the same as the effective stack height. The nearest terrain on which impingement might occur is a mountain to the southeast. Impingement of the plume on the mountain will most likely occur between 500 and 800 meters downwind with a northwest wind. The distance at which impingement will occur varies with the plume height. With a higher plume, the impingement distance will be farther downwind since the higher elevations are more distant than the lower elevations.

From the limited wind data which has been collected by the Air Quality Bureau at Bonner within 200 feet of the proposed emission source, the most persistent wind from the northwest lasted four (4) hours and averaged 1.92 m/sec. This wind was from 330°.

BONNER AREA


5200
4600
4200
3800
3400
PINEGROVE
WEST
RIVERSIDE
CLARK
FORK
BLACKFOOT RIVER
BONNER
MILLTOWN
RIVER
PITZVILLE
LEGEND
Railroad
Interstate Highway
Paved Road
Unpaved Road
Contour Line
House
Plant Facilities
Current Monitoring Site
Possible Future Site
Maximum Modeling Estimate
N
Scale 1:24,000
Taken from USGS 7 1/2' quadrangle maps

It should also be noted that the highest (does not have to be consecutive) frequency of NW winds for a 24-hour period consisted of these same 4 hours of 330° wind. The wind data was collected over a 30-day period during March and April.

The Air Quality Bureau estimates for ground-level particulate concentrations downwind from the veneer dryers assumed adverse meteorological conditions which would maximize the final results. The possibility of several assumptions made in the calculation is real, but the probability of those assumptions remaining valid as a combination of meteorological parameters is remote. The calculations presented below are similar to those made for the draft statement. However, they are more extensive and include updates in meteorological and emission data. Plume rise was calculated from Plume Rise by Briggs (eqn. 5.7)

There are 18 stacks from the veneer dryers and estimates were made individually for each stack with the final result equaling the sum of the individual components from each stack. The heat emissions for each stack were considered separately and the distance between stacks was incorporated into the calculations. The assumption that all 18 stacks do not contribute collectively to a higher plume rise than an average of the individual plume rises is not completely valid. The real plume rise will probably be higher than that used in the calculations since no combined buoyancy effects were considered. This assumption will thus result in inflated estimates from the model.

A 1.92 m/sec wind speed was used in the calculations which was the actual speed recorded with the NW winds. With winds less than 2 m/sec, Pasquill stability categories "A" or "B" should be assumed according to Table 3.1 of the Workbook of Atmospheric Dispersion Estimates. Utilizing dispersion coefficients from Pasquill stabilities "A" or "B" will result in lower estimates than stability "D" dispersion coefficients. To maximize estimates, stability "D" dispersion coefficients were utilized in the equation.

A potential temperature lapse rate of .0206°C/m will be near its most stable condition. With a very stable lapse rate, plume rise will be limited, and the resulting effect on dispersion concentration will be to increase the estimates. If the winds

were to persist for several hours such as in the case noted above, the inversion condition would be eliminated through continued mixing. Therefore, the assumption of a lapse rate of .0206°C/m is somewhat uncertain. A more easily accepted potential temperature lapse rate reflecting stable conditions would be .0047°C/m. However, to maximize the results of the model, the .0206°C/m lapse rate was used in the calculations. Source data listed in Table 3 were used to mathematically model for maximum 24-hour concentrations.

The plume rise values ranged between 31 and 46 meters with the average near 40 m. The final effective plume heights ranged between 48 and 63 meters with the average near 57 meters. With an effective plume height of 57 meters and a NW wind direction, the plume will impact on the mountain near 3483 feet (MSL) and approximately .54 km distance from the proposed dryers.

Equation 3.1 from Turner's Workbook of Atmospheric Dispersion Estimates served as the mathematical model for calculating the dispersion estimates. Incorporated into the model were the elevation differences and the lateral spacing of the dryer stacks. Pasquill stability "D" dispersion coefficients utilized in this equation were extracted from Figures 3.2 and 3.3 of the same publication. It should be noted that in previous discussion, low wind speeds resulted in higher plume rises and thus lower concentrations. A lower wind speed used in equation 3.1 of Turner will raise concentration estimates.

The emission data for the dryer stacks have been changed as a result of additional information presented since the draft statement was released. In the draft statement, the total particulate emissions from the veneer dryers were expected to approximate 33 lbs/hour. As a result of new test data regarding low-temperature drying, particulate emissions are expected to be half of what was originally incorporated into the model. The particulate emission rate used in equation 3.1 was equivalent to 16.5 lbs/hour. In addition, more complete data on stack parameters became afailable.

Meteorological parameters utilized in the model to estimate for a maximum concentration included:

TABLE 3

Dryers	Stack Temperature (^{o}F)	Stack Height (m)	Dry Air Volume (SCFM)	H_2O Volume (SCFM)	Particulate Emissions (gr/sec)	Heat Emission (cal/sec)	Plume Rise (Meters)	Distance from Center Line (Meters)
1.1	275	17	1540	810	.128	42,182	31	24.4
1.2	275	17	4610	1040	.128	100,861	42	24.4
1.3	250	17	3080	460	.174	56,480	34	24.4
2.1	275	17	3080	1210	.128	76,840	38	12.2
2.2	275	17	6150	1560	.128	137,721	46	12.2
2.3	250	17	4610	690	.174	84,562	39	12.2
3.1	290	17	3080	1060	.128	78,620	38	0
3.2	280	17	4610	1270	.128	107,292	43	0
3.3	260	17	4610	1270	.089	98,576	42	0
3.4	250	17	4610	635	.086	83,641	39	0
4.1	290	17	3080	1150	.128	86,357	40	-12.2
4.2	280	17	4610	1385	.128	109,444	43	-12.2
4.3	260	17	4610	1385	.089	100,574	42	-12.2
4.4	250	17	6150	690	.080	108,949	43	-12.2
5.1	290	17	4610	1350	.128	113,107	43	-24.4
5.2	280	17	4610	1615	.128	113,747	44	-24.4
5.3	260	17	6150	1615	.089	130,129	46	-24.4
5.4	250	17	6150	810	.086	110,960	43	-24.4

Wind speed	1.92 m/sec
Potential Temperature Lapse Rate	.0206°C/M
Distance Downwind	540 meters
Height above Plant Base	57 meters
Horizontal Dispersion Coefficient	39 meters
Vertical Dispersion Coefficient	20 meters

The model predicted a maximum concentration of 87.3 ug/m^3 .54 km (at 150°) downwind impacting at an elevation of 3483 feet (msl). This concentration represents the summed total of all 18 stacks on that point for 24 hours. Comments to the draft statement with respect to the modeling stated that the dispersion estimates presented in the draft were for a period of 10 minutes to one hour and that to expect such a condition to persist for 24 hours was unrealistic. These same comments further stated that a more realistic estimate would be to expect those conditions to occur for only 12 hours in a 24 hour day, thus the original estimate should have been halved. It should be noted that all estimates (past and present) are for a 24-hour period and represent 43% of the 10-minute figure obtained from Turner's model. The 43% figure was derived from equation 5.12 of Turner. This figure is needed to convert 10 minute estimates to 24-hour estimates.

As repeated several times above, the 87.3 ug/m^3 figure is a maximum estimate. It is important to note that the 87.3 ug/m^3 represents a 24-hour estimate. A corresponding 10 minute estimate would be 203 ug/m^3.

An average day at Bonner might exhibit a southwest wind of 2.2 m/sec. The ambient temperature at the plume centerline with these conditions might be 279°C and the potential temperature lapse rate might approximate .00003°C/m. Pasquill dispersion coefficients should range between "C" and "D" stabilities. Using the typical day conditions, the maximum ground-level 24-hour concentration would approach 0.50 ug/m^3 from the dryers. Total particulate emissions from the entire plant including boiler emissions, dryer emissions, road dust and fugitive emissions might result in a 6.2 ug/m^3 contribution for a "typical day" at Bonner. This value does not approach any state or federal standards.

This "typical day" estimate also reflects the remote possibility of the maximum estimates discussed previously.

A separate calculation was made for the school location under very stable and adverse meteorological conditions. The maximum contribution possible for 24-hour ranged near 15 ug/m^3. This estimate incorporated a combination of meteorological parameters which would not likely occur and included emissions from the entire plant.

For the "typical day" and school yard situations, the single stack approach was utilized in the modeling. This assumes all emissions are from one stack. For these two estimates an average heat emission from the 18 stacks was incorporated into the calculations. Both assumptions combined are expected to increase estimates about 10% above those estimates that summed components of 18 stacks with separate heat emissions.

No annual estimates were calculated as the wind rose data necessary for the model are not available.

4. Impact on Visibility

Some reduction in visibility will be experienced in the Bonner area, both from hydrocarbon emissions and under certain circumstances from water emissions. Air Quality Criteria for Particulate Matter (HEW, 1969) presents a table relating visual range to mass concentration of particulate matter.

Table 4 has been extracted from the above.

TABLE 4

Mass Concentration ug/m^3		Equivalent Visual Range Miles
10	+10 -5	75.00
30	+30 -15	25.00
100	+100 -50	7.50
300	+300 -150	2.50
1000	+1000 -500	0.75

The + and - numbers on the left indicate the range of concentrations at which visibility may be the value on the right. The values on the far left indicate the concentrations corresponding to a specific particle size distribution, particle density, and volume concentration. The publication refers to a "low humidity, well-aged haze" which by their definition satisfied the above criteria. Varying the parameters mentioned will alter the particulate concentrations corresponding to given visual range. Further, on pages 3-26, the same publication states:

> "Equation 3-9 [relating mass concentration to visual range] provides a convenient means for estimating the expected visibility for different levels of particulate concentrations under the conditions stated. With a typical rural concentration such as 30 ug/m^3, the visibility is about 25 miles; for common urban concentrations, such as 100 and 200 ug/m^3, the visibility would be 7.5 miles and 3.75 miles respectively. . . .Federal air regulations prescribe limitations on aircraft operating under concentrations of reduced visibility; they become increasingly severe as the visibility decreases from 5 miles (150 ug/m^3) to 3 miles (250 ug/m^3) to one mile (750 ug/m^3). Based on the empirical variations in equation 3-9, the same visibilities could occur under certain circumstances, at concentrations one-half of these calculated values. Thus, a concentration of 75 ug/m^3 might produce a visibility of 5 miles in some instances."

We do not have sufficient data to quantify the visibility reduction to be expected in the area. There are enough significant differences between the immediate Bonner area and the larger Missoula valley to preclude extrapolation of data and results there.

5. Impact on Weather

Comments to the draft indicated that water emissions might have significant adverse effects. The "state of the art" in this field makes it difficult to predict such effects. Therefore, the following data is presented without specific conclusions.

By dividing water emission rates by particulate emission rates and adjusting the resulting maximum estimate of ground level particulate emission by this factor, one arrives at a water concentration of 1.7 g/m^3 ($\approx$1.52 g/kg). This amount of water would saturate a dry volume of air in Bonner at -12°C. Similarly, comparing particulate emissions with water emissions for a "typical day" are arrived at a maximum water vapor concentration of .0098 g/m^3. This water vapor concentration would saturate the air at near -41^{0}C.

These calculations do not consider latent heat of condensation nor latent heat of fusion. These calculations also do not consider the additional plume rise resulting from the colder ambient temperatures. These estimates discussed above would be reduced if these other parameters were incorporated into the model.

The total water emissions will be increased by 50% over current output. The combined effect of this water with existing atmospheric moisture is difficult to evaluate. With near freezing temperature downwind from the source, the potential for condensation in the form of fogging or precipitation will probably exist. The combined effect of water and particulate emissions is difficult to assess.

The "state of the art" in inadvertent weather modification recognizes precipitation variation due to industrial influences. To suggest precipitation will increase or decrease, requires knowledge of condensation physics, local humidity data and existing precipitation variation. Most of this information is unavailable for the Bonner area.

Variations in fog frequency at Bonner may be suggested since fog incidence at the Missoula airport seems to be deviating the natural state. The frequency of fog incidence at the Missoula airport may be related to industrial influences. The Missoula airport may not be a fair representative for Bonner, but it is currently one of the better available.

C. Secondary Impacts

1. Construction

The construction impacts associated with this facility will be essentially the same as those of many other industrial or commercial constructions. There will be a certain amount of noise generated from the equipment and from the activities involved in construction of a building. Some dust will be generated from the mobile equipment transporting equipment and supplies to and from the site and on the site. This will result in some temporary dust deposition in the adjacent properties and buildings. This will be categorized generally as nuisance dust and not as dust specifically harmful to the health. Dust suppression will minimize these effects.

2. Impact on the Human Environment

The social, cultural and economic aspects of the human environment will be affected by implementation of this proposal, but the effects should be improvements. The Missoula area presently has an unemployment rate of approximately 10%. The plywood plant is expected to employ about 500 people. The applicant feels that a sufficient work force is available locally and there should not be an influx of people. This further indicates that existing services such as schools, transportation, water supply, sewage treatment, etc., need not be expanded. Some professional people may not be available locally and may be recruited. Should a particle board plant be built, the facility would employ about 800 people, compared to 600 for the Anaconda operation in full production. There should be a considerable revenue generated, both from the purchase of goods and services during construction and from the plant payroll when the plant becomes operational.

The social and cultural atmosphere of the area should not be significantly altered in form. As previously mentioned, no influx of people is expected so the form of existing institutions should not be changed. There may, and probably will, be changes within the institutions, corresponding generally with changes in income distribution.

The wood products industry is, by and large, the basis for the area's economy. Therefore, any social or cultural institutions characteristic of the area would be greatly influenced by the wood industry. Construction and operation of this plant should have little, if any, effect on these.

3. Land Use

The site of the plywood plant has been used industrially for several years and will continue in that status whether the proposal is implemented or not. The immediate environs might be subjected to land use change due to increased income, but this appears unlikely at present. The site chosen for the plant may have been a poor choice if one considers present criteria for industrial areas, but the fact remains that the land is industrial.

4. Water Use

The table presented below summarizes the water usage at the Bonner facility presently and for the future.

TABLE 5
WATER USES

Use \ Quantity	Present	w/Plywood Plant	w/Plywood & Part. Bd
Lumber Mfg.			
Sawmill (Hyd Debarker)	1000	---	
Dry Kilns	5	5	5
Planer Mill	20	20	20
Plywood	---	100	100
Log Sprinkling	---	350	350
Pargicle Board	---	---	250
Power Generation			
a) Cooling & Misc	600		
b) Scrubber Makeup	85	85	85
c) Boilers including Dutch ovens and gas boiler	400	400	400
	2110	960	1210

All values in gallons per minute (GPM)

It is obvious from the above table that removal of water from the Blackfoot River will decrease with implementation of the proposal. The present hydraulic debarker is operating on a variance and will be discontinued, thereby reducing water requirements by approximately 1000 gallons per minute. The plywood plant and board plant water consumption will add up to 450 GPM. At the same time, the water cooled compressors for the boilers are being phased out and replaced with air-cooled types. The remaining water-cooled ones will obtain cooling water from other sources within the plant, rather than drawing fresh water from the rivers. Makeup water for the boilers will require increased draw from the river.

Discharges to the river will be markedly reduced as plant expands. Table 6 below gives present and anticipated discharges.

TABLE 6
DISCHARGE TO RIVER

	Present	w/Plywood	w/Plywood & Part. Bd.
Lumber Manuf.	1025	25	25
Plywood Plant	--	--	--
Log Sprinkler	--	--	--
Particle Board	--	--	--
Power Generation	600	150	65
Treated Sewage	16	32	32
	1641	207	122
W/Contingency	1641	414	244

All values in GPM

The discharge reductions accrue from discontinuance of the hydraulic debarker and phasing out of water cooled compressors. Increases are from sewage treatment plants. There is an existing treatment plant of 15,000 gallons per day (GPD) capacity and a facility very similar in design will be added (capacity 15,000 GPD). Both treatment plants have been approved by state and federal water authorities. Even with a 100% contingency factor, river discharges will be reduced nearly a factor of 4 with construction of the plywood plant. There is an estimated loss of 50 GPM for underground disposal and surface containment.

Losses to atmosphere occur from evaporation from the log sprinkling system, and log soaking vats, and from boiler vents, dry kilns, boiler scrubber, other miscellaneous sources. These sources are estimated to give off about 300 GPM. (See previous discussion on water emissions.)

D. Regulations and Plans for Compliance

Several of Montana's regulations regarding emissions are applicable to sources at the Bonner plant. These regulations are included in their entirety in Appendix A. Both new and existing sources are affected by the regulations. In addition, ambient air standards must be met.

The veneer dryers must meet Regulation 90-007 "Visible Emissions" and Regulation 90-004, the "Process Weight Law." The visible emission standard restricts the emission of visible air contaminants to 20% opacity. The process weight law specifies the maximum amount of particulate in #/hr that can be emitted to the atmosphere. From data supplied by the applicant, the average process weight rate will be 95,540 #/hr which results in an allowable emission of 44.2# of particulate/hour. This allowable will vary from 42.7 #/hour to 49.3 #/hour depending on the moisture content of the wood, therefore, the process weight rate.

The allowable operating limits for the boilers vary according to input, also. Like the process weight law, more emission is allowed at higher inputs, but lower emission per unit of input. The existing suspension fired-boiler has been tested and determined to be in compliance. The dutch oven boilers will also operate in compliance.

It presently appears that all applicable ambient air quality standards will be met. In fact, reductions in total suspended particulate are expected from levels experienced during full scale production of Anaconda Forest Products. The possibility exists, however, that a standard or regulation might be exceeded.

Therefore, the permit will be issued for the proposal as revised, in light of the new information received and with conditions attached.

U. S. Plywood has several times stated that they will meet the regulations as they exist and will comply with future regulations. The following is the U. S. Plywood-Champion Paper's policy on the environment:

> "It is the policy of Champion International to recognize constructively the public interest in our natural resources and the quality of the environment in the areas in which the company operates. Operation in both the forest and the manufacturing plants will be carried out with the spirit and not merely the letter of environmental quality standards and company timber lands will be managed to assure accepted conservation practices and sound multiple use."

In light of certain comments received and the state's previous experiences, certain conditions will be attached to the permit. These conditions,including stipulations as to sampling, shakedown periods, installation of secondary control, time limits and others, have been attested to by W. E. Butler, of U. S. Plywood-Champion International in a letter containing a certification of commitment dated April 13, 1973. The letter and certification are included in Appendix A.

These conditions will be attached to the permit. According to Regulation 90-001, (See Appendix B) Sec. XIII, operation under such a conditional permit "shall be deemed acceptance of all the conditions so specified." Further, Sec. VIII of the same regulation states "nor shall approval of plans and specifications under this regulation or issuance of a permit under this regulation excuse anyone from full future compliance with any of the foregoing"(air pollution laws, rules and standards, present and future.)

Based on information obtained and the predictions and evaluations, the emissions should not violate any limitation. In the unlikely event that standards are exceeded, we feel confident that more than adequate provisions have been made for this contingency.

IV. ADVERSE EFFECTS WHICH CANNOT BE AVOIDED SHOULD THE PROPOSAL BE IMPLEMENTED

The following are adverse effects which under any circumstances cannot be avoided if this facility is put into operation as it has been proposed.

1. A certain amount of noise will be generated temporarily during construction process.

2. The emission regulation would allow approximately 1045 #/day of particulate emission from the dryers. Expected emission from the dryers as proposed would be about 408 #/day; at this rate of emission, the ambient standards should not be exceeded.

V. RELATIONSHIP BETWEEN SHORT TERM USES OF THE ENVIRONMENT AND LONG TERM EFFECTS

In general the wood products industry has not been known for its foresight in considering the relationships between short term uses and long term uses of resources. The question here is whether the use of a tree to make plywood is better than the use of a tree to make something else, or to remain in the woods and continue its natural processes.

The wood products industry manufactures and markets products which are used for construction purposes, increasingly for residential construction. Therefore, their use of the environment and resources is generally considered to be for the betterment of society in that it is used to create shelter for the populace. There could be much discussion as to whether the products are used wisely. We see many homes and other structures in which wood is used extensively in excess of what would be required to perform the utilitarian functions of the residence or structure. One might also note that certain species are used when another might do, and that one species may be considerably more scarce than another.

One might also question whether the wood is necessary at all. Perhaps there are synthetics or substitute materials that could be used in place of wood which would be a lesser drain on the environment; for example, plywood is used extensively for sheathing residential homes, but other materials are available for the same purpose. One could use particle board, a wood product formed from the wastes generated from other operations in the wood products industry. Trees are generally not cut down to make particle board. However, if the trees were not cut down to make plywood or lumber, then there wouldn't be any waste and trees might be cut to make particle board.

The energy consideration, fast becoming so important, and in some areas critical, enters into the discussion. According to figures from the National Materials Policy Commission, it takes 430 kilowatt-hours of electricity to produce a ton of lumber 2,700 KWH per ton of steel, and 17,000 kwH per ton of aluminum. Further, an Oregon State University study stated that, if manufacturers were required to bear the cost of their

effect on the environment, the cost of concrete blocks would rise 48%, aluminum 28%, ready-mix concrete 24%, steel 9%, and wood 2%. These last figures, if true, lend themselves to drawing a couple of conclusions. One is that perhaps the price of wood is too high (or others too low) and should be lowered (raised) to more adequately reflect the industries effect on the environment. Another is that the wood products industry might be in better position than the others mentioned to pay for its effects on the environment. The third conclusion is that wood might be one of the least costly building materials from an environmental standpoint.

Another factor to consider is the renewability of timber as a resource. This initiates discussions, arguments, and legal actions regarding sustained yield, multiple use forests, wilderness and roadless areas, etc. For the plant as proposed, the effects of emissions are expected to continue as long as the plant is operational. However, the effects of the timber might continue for some time afterwards.

VI. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF NATURAL AND ECONOMIC RESOURCES

In this type of operation, very few of the commitments of resources are totally irreversible or irretrievable. The electricity, once used, is gone, but if the electricity is not available it won't be used. A certain amount of natural gas will be used per year. Given the present economic situation and considering the use of resources on a more practical time scale, the materials of construction are essentially committed for an indeterminate time. A certain amount of manpower is required to operate the facility and the proposed requires an investment by the company of over 15 million dollars. There is a commitment to cut enough timber to sustain the operation. The actual use of the timber may or may not be considered irreversible or irretrievable, depending on one's time scale.

VII. RELATIONSHIP BETWEEN ECONOMIC BENEFITS AND ENVIRONMENTAL COSTS

The economic benefits of accruing from this plant will continue as long as the plant remains operational. Many of the effects of the emissions would cease to be noticed were the plant to shut down. Other effects, such as respiratory ailments, would continue to be noticed after removal of the source. In the case at hand, no such effects are expected. In fact, improvement of conditions experienced in previous years is expected. Visibility reductions, though minimal, are expected and are representative of the type of impact that would disappear. Water vapor emissions are another example of this type of impact. In regard to weather modification, the state of the art is not sufficient to predict effects.

In general, environmental costs, although not quantifiable and expected to be low, will continue as long as the plant is operating. The same is true of the economic benefits.

VIII. ALTERNATIVES TO THE PROPOSED ACTION

The first and most obvious alternative is not to build this installation. This alternative would be considered by most as undesirable. The project would employ a sizeable number of people who are not presently employed but who are in the area, thereby reducing the unemployment. The construction phase would also generate considerable revenue. The land area will remain industrial regardless of alternatives. It is presently expected that all applicable regulations and standards will be met, therefore adverse environmental effects should not be significant.

A slightly less drastic alternative would be reducing the size of the plant. The plant could operate at any capacity down to its lower economic limit. This is a feasible alternative and might be considered if standards are exceeded. However, this would entail a reduction in employment and possibly a reduction in the amount of timber used.

Building the plant with no provisions for emission control is another available alternative but an unacceptable one from the state's point of view.

The applicant, as another alternative, could construct the plant at a different location. For the present situation, this is an unacceptable and impractical alternative, at least to the applicant. U. S. Plywood owns the proposed location and would have to purchase land anywhere else. The location is suitable for the use of the available timber, and transportation facilities and market access are considered good. Other locations providing better atmospheric dispersion of emissions could be found, but present indications are that this is not necessary.

There are several alternatives regarding forms of emission control in addition to the one as proposed. Wet scrubbing has been used to control veneer dryer emissions but not on a full scale basis. The wet scrubbing approach may be used as secondary control if the low temperature route does not prove successful. However, the scrubbing approach, while fairly efficient (35%), generates other problems. There is a problem of disposal

of the collected organic materials; fortunately the nature of the compounds is such that removal of them from water is not difficult but there is still a disposal problem. Also, a sizeable vapor emission may occur. Present indications are that treatment of all the emissions from the dryers at Bonner would require approximately 300 gallons per minute of water. This could have a bearing on the situation. This scrubber is rather simple and therefore has low maintenance requirements and is a fairly low-energy system.

Another system being evaluated for dryer emission control is one employing a fiber glass mat to filter the particulate matter. This has been used in two forms, one employs a water spray to condense the hydrocarbons. This also obtains some control by scrubbing action of the emissions. This system requires a fairly high capital expenditure, has high energy requirements and is one of the more mechanically complex control devices available. This type of control also generates a secondary disposal problem. The condensed material must be removed from the water if water is used and the fiber glass filter media is not reusable and must be disposed of.

Incineration is another alternative that has been used for control of these emissions. The stack gases are vented to an incinerator fired with natural gas or other auxiliary fuel. The hydrocarbons, being combustible, are burned to completion in the high temperature furnace. Natural gas serves best as the auxiliary fuel but it is expensive, consumes an already scarce resource and is unavailable to the Bonner mill. Other fuels, such as oil, sander dust, and pulverized wood waste have been used with varying degrees of success. This has an added benefit of disposing of the hydrocarbons by combustion to CO_2 and water and some secondary heat recovery is available.

A recently developed control device known as a finned-tube matrix heat exchanger condenser has been used on a small scale. This device condenses the hydrocarbons on metal fins but it presently does not hold much promise as there is a problem removing the condensed hydrocarbons from the device itself. Should the proposed low temperature system prove inadequate any of the alternatives regarding emission control will be further investigated.

APPENDIX A

Regulation 90-001

Regulation 90-004

Regulation 90-006

Regulation 90-007

AIR POLLUTION CONTROL
CONSTRUCTION AND OPERATING PERMITS

Regulation No. 90-001

Adopted March 23, 1969
Revised January 9, 1970
Revised July 10, 1970
Revised June 24, 1972
Montana State Department of Health and Environmental Sciences
Helena, Montana

Provisions concerning application for and granting of permits to construct, operate, install or alter any machine, equipment, device or other article or process which may cause or contribute to air pollution.

I. POLICY STATEMENT

New equipment or changes of process capable of becoming a source of air pollution shall be provided with the maximum control capability which is technically practicable and economically feasible. Any equipment shall be operated to provide the maximum control capability.

II. PERMIT TO CONSTRUCT

A permit shall be required from the Administrator of the Environmental Sciences Division, Montana State Department of Health and Environmental Sciences, for the construction, installation or alteration of any new equipment of changes of process capable of emitting air contaminants to the atmosphere and any new, altered or revised equipment intended for eliminating, reducing or controlling emission of air contaminants from the following classes of operation:

1. All phosphate rock or phosphorite processing equipment or equipment used in the production of elemental phosphorous, enriched phosphates, defluorinated phosphates, phosphate fertilizers or phosphorite concentrates or any equipment used in the processing of fluorides-enriched waste waters to produce fluorides compounds for sale.

2. Industrial and commercial power generating plants except railroad locomotives and hydroelectric.

3. All metallurgical operations such as smelting, refining or reclaiming of any metals or minerals or their by-products.

4. Petroleum refining, marketing and pipelining.

5. Any rock crushing, or gravel cleaning or sizing operations including mobile units in operation or existing in the State at the time of passage and approval of this regulation.

6. Asphalt batching or hot-mix plants including mobile units in operation or existing in the State at the time of passage and approval of this regulation.

7. Pulp mills and paper mills.

8. All lumber mills or wood products operations that will burn waste wood as a means of disposal or for boiler fuel.

9. Acid manufacturing plants.

10. Chemical plants.

11. Cement plants manufacturing cement.

12. Slaughter houses and/or rendering works.

13. Fertilizer manufacturing plants.

14. Foundries.

15. Any industrial or commercial boiler or furnace burning for fuel wood, coal or heavy petroleum products.

16. Concrete batching plants.

17. Metal scrap salvage, processing, or reclaiming operations.

18. Manufacturing plants or concerns manufacturing or processing dyes; adhesives, radioactive materials; plastics; resins; detergents; soap, tallow; paint; varnish; animal, vegetable or mineral oils; rubber; animal, vegetable and mineral fibers; biological materials; glass; bricks, pottery or chinaware; grains; beverages (except bottling plants); coal, including coal washers and coke; clay, diatomacious earth or dolomite; manure; hides and furs; vegetables, meat, fish or flour (except food service establishments).

19. Canneries

III. PLANS AND SPECIFICATIONS

The application for a permit shall be accomplished by plans, specifications, and such other information as the director deems necessary except that the director may dispense with the submission of plans and specifications upon prior written agreement.

IV. TRANSFER OF PERMITS

Permits issued shall not be transferrable either from one location to another, from one piece of equipment to another or from one person to another.

V. DENIAL OF PERMIT APPLICATION

Upon refusal by the director to grant a permit after request therefore, the director shall submit the permit application to the Board for their review and final action.

VI. DEFINITIONS

1. Equipment: Any article, machine, equipment or other contrivance, the use of which may cause the issuance of air contaminants or which may be designed for or used to control air contaminants.

2. New Equipment:

   a. Any equipment, installation, construction, article, machine or contrivance constructed or installed after the effective date of this regulation;

   b. Any equipment replaced or altered or processes changed in such a manner after the effective date of this regulation as to have any substantial effect on the production or control of air contaminants;

   c. Any equipment moved after the effective date of this regulation to another premise involving a change of address;

   d. Any equipment purchased and to be operated after the effective date of this regulation by a new owner or when a new lessee desires to operate such equipment;

   e. Any equipment that is or has been shut down, put out of service or otherwise made inoperative for 180 days or more after March 23, 1968, and which is to be put back into operation or service.

   f. Any equipment whose construction was started prior to March 23, 1968, and remained uncompleted 180 days or more after March 23, 1968.

3. Substantial:

   a. The word substantial as appearing in subsection 2 (b) of this section VI shall be defined as follows:

      1. Increases the amount of any air pollutant (to which a standard applies) emitted, or which results in the emission of any air pollutant (to which a standard applies) not previously emitted, except that:

         a. Routine maintenance, repair, and replacement shall not be considered as alterations;

         b. The following shall not be considered a process change:

            i. An increase in the production rate, if such increase does not exceed the operating design capacity of the affected facility;

ii. An increase in hours of operation;

iii. Use of an alternative fuel or raw material if the affected facility is designed to accommodate such alternative use.

VII. TIME LIMIT FOR PERMIT

If the construction, installation or alteration for which a permit has been issued is not completed within two years from the date of issuance of the permit, a renewal of the permit shall be required.

VIII. COMPLIANCE

Nothing in this regulation shall be construed as relieving any permittee from full compliance with all laws of the state of Montana and any applicable Federal laws respecting the subject of air pollution and all other regulations, rules and standards heretofore or hereafter adopted by the State Board of Health, or applicable Federal agency respecting air pollution, including, but not limited to, all present and future provisions of the air pollution control statutes of the State of Montana, further regulations governing permits of any kind, and emission standards; nor shall approval of plans and specifications under this regulation or issuance of a permit under this regulation excuse anyone from full future compliance with any of the foregoing.

IX. CONFIDENTIALITY

Any plans, specifications or records or parts thereof, which are deemed by the owner or operator as confidential shall be clearly designated and certified by said owner or operator.

X. AUTHORITY

The authority to promulgate this regulation is provided in Section 8 of the Clean Air Act of Montana, enacted by the Legislative Assembly of Montana in 1967.

XI. PERMIT TO OPERATE

Before any article, machine, equipment or other contrivance described in Section II of this regulation may be operated or used, a written permit shall be obtained from the Director. No permit to operate or use shall be granted by the Director for any article, machine, equipment or contrivance described in Section II of this regulation constructed or installed without authorization as required by Section II of this regulation, until the information required pursuant to these regulations is presented to the director and such article, machine, equipment or contrivance is altered, if necessary, and made to conform to the standards set forth elsewhere in the standards and regulations formulated under authority of the Clean Air Act of Montana.

A. Posting of Permit to Operate

A person who has been granted a permit to operate any article, machine, equipment, or other contrivance shall firmly affix such permit to operate, an approved facsimile, or other approved identification bearing the permit number upon the article, machine, equipment or other contrivance in such a manner as to be clearly visible and accessible. In the event that the article, machine, equipment or other contrivance is so constructed or operated that the permit to operate cannot be so placed, the permit to operate shall be mounted so as to be clearly visible in an accessible place within 25 feet of the article, machine, equipment, or other contrivance, or maintained readily available at all times on the operating premises.

XII. STANDARDS FOR GRANTING APPLICATION

A. The director shall deny an authority to construct, or permit to operate or use, except as provided in Section XIII of this regulation, if the applicant does not show that every article, machine, equipment or other contrivance, the use of which may cause the issuance of air contaminants, or the use of which may eliminate or reduce or control the issuance of air contaminants, is so designed, controlled, or equipped with such air pollution control equipment, that it may be expected to operate without emitting air contaminants in violation of standards and regulations formulated under authority of the Clean Air Act of Montana, or will interfere with the attainment or maintenance of any applicable national standards, or violate any regulations promulgated by the Administrator of the U. S. Environmental Protection Agency pursuent to the Federal Clean Air Act as amended.

B. Before an authority to construct or a permit to operate is granted, the Director may require the applicant to provide and maintain such facilities as are necessary for sampling and testing purposes in order to secure information that will disclose the nature, extent, quantity or degree of air contaminants discharged into the atmosphere from the article, machine, equipment or other contrivance described in the authority to construct or permit to operate. In the event of such a requirement, the director shall notify the applicant in writing of the required size, number and location of sampling holes; the size and location of the sampling platform; the access to the sampling platform; and the utilities for operating the

sampling and testing equipment. The platform and access shall be constructed in accordance with applicable laws and regulations concerning safe construction and safe practice.

C. In acting upon a permit to operate, if the director or a member of his staff finds that the article, machine, equipment or other contrivance has not been constructed in accordance with the authority to construct, he shall deny the permit to operate. The director shall not accept any further application for permit to operate the article, machine, equipment, or other contrivance so constructed until he finds that the article, machine, equipment, or other contrivance has been constructed in accordance with the authority to construct.

XIII. CONDITIONAL APPROVAL

A. The director may issue an authority to construct or a permit to operate or use, subject to conditions which will bring the operation of any article, machine, equipment or other contrivance within the standards of Section XII of this regulation, in which case the conditions shall be specified in writing. Commencing work under such an authority to construct or operation under such a permit to operate shall be deemed acceptance of all the conditions so specified. The director shall issue an authority to construct or a permit to operate with revised conditions upon receipt of a new application, if the applicant demonstrates that the article, machine, equipment or other contrivance can operate within the standards of Section XII of this regulation under the revised conditions.

XIV. DENIAL OF APPLICATIONS

A. In the event of denial of an authority to construct, or permit to operate or use, the director shall notify the applicant in writing of the reasons therefor. Service of this notification may be made in person or by mail, and such service may be proved by the written acknowledgment of the persons served or affidavit of the person making the service. The director shall not accept a further application unless the applicant has complied with the objections specified by the director as his reasons for denial of the authority to construct, or the permit to operate or use.

XV. EFFECTIVE DATE

The effective date of this regulation 90-001 shall be June 30, 1970, as amended.

RESTRICTION OF EMISSION OF PARTICULATE MATTER FROM INDUSTRIAL PROCESSES

A. Emission Limitations

No person shall cause, suffer, allow, or permit to be discharged into the outdoor atmosphere from any operation, process or activity, except (a) fuel burning equipment and (b) incinerators, particulate matter in excess of the amount shown in Table I of this regulation. When the process weight falls between two values in the table, the maximum weight discharged per hour shall be determined by interpolation

When the process weight exceeds 60,000 pounds per hour, the maximum allowable weight discharged per hour will be determined by use of the following equation:

$$E = 55.0\ P^{0.11} - 40$$

Where E = Maximum rate of emission in pounds per hour --
P = Process weight rate in tons per hour.

TABLE I

Process Weight Rate		Rate of Emission	Process Weight Rate		Rate of Emission
Lb/Hr	Tons/Hr	Lb/Hr	Lb/Hr	Tons/Hr	Lb/Hr
100	0.05	0.551	16,000	8.00	16.5
200	0.10	0.877	18,000	9.00	17.9
400	0.20	1.40	20,000	10.	19.2
600	0.30	1.83	30,000	15.	25.2
800	0.40	2.22	40,000	20.	30.5
1,000	0.50	2.58	50,000	25.	35.4
1,500	0.75	3.38	60,000	30.	40.0
2,000	1.00	4.10	70,000	35.	41.3
2,500	1.25	4.76	80,000	40.	42.5
3,000	1.50	5.38	90,000	45.	43.6
3,500	1.75	5.96	100,000	50.	44.6
4,000	2.00	6.52	120,000	60.	46.3
5,000	2.50	7.58	140,000	70.	47.8
6,000	3.00	8.56	160,000	80.	49.0
7,000	3.50	9.49	200,000	100.	51.2
8,000	4.00	10.4	1,000,000	500.	69.0
9,000	4.50	11.2	2,000,000	1,000.	77.6
10,000	5.00	12.0	6,000,000	3,000.	92.7
12,000	6.00	13.6			

Interpolation of the data in this table for process weight rates up to 60,000 lb/hr shall be accomplished by use of the equation $E = 4.10\ P^{0.67}$, and interpolation and extrapolation of the data for process weight rates in excess of 60,000 lb/hr shall be accomplished by use of the equation: $E = 55.0\ P^{0.11} - 40$, where E= rate of emission in lb/hr and P= process weight rate in tons/hr.

B. Effective Date

The effective date of this regulation for existing equipment shall be June 1, 1970. For new equipment, the effective date shall be November 23, 1968.

Regulation 90-006

MAXIMUM ALLOWABLE EMISSION OF PARTICULATE MATTER FROM FUEL BURNING EQUIPMENT

A. Particulate Matter from Fuel Burning Equipment

No person shall cause, suffer, allow or permit particulate matter caused by the combustion of fuel to be discharged from any stack or chimney into the atmosphere in excess of the hourly rate set forth in the following table:

Heat Input in Million British Thermal Units per hour	Maximum Allowable Emissions of Particulate Matter in Pounds per Million British Thermal Units	
	Existing Fuel Burning Equipment	New Fuel Burning Equipment
Up to and including 10	0.60	0.60
100	0.40	0.35
1,000	0.28	0.20
10,000 and above	0.19	0.12

B. For a heat input between any two consecutive heat inputs stated in the preceding table, maximum allowable emissions of particulate matter are shown for existing fuel burning equipment on Figure 1 and for new fuel burning equipment on Figure 2. For the purposes hereof, heat input shall be calculated as the aggregate heat content of all fuels (using the upper limit of their range of heating value) whose products of combustion pass through the stack or chimney.

1. When two or more fuel burning units are connected to a single stack, the combined heat input of all units connected to the stack shall be used to determine the allowable emission from the stack.

2. When a single fuel burning unit is connected to two or more stacks, the allowable emission from all the stacks combined shall not exceed that allowable for the same unit connected to a single stack.

C. The effective date of this regulation for existing equipment shall be June 1, 1970. For new equipment, the effective date shall be November 23, 1968.

FIGURE 1

MAXIMUM EMISSION OF PARTICULATE MATTER FROM EXISTING FUEL BURNING INSTALLATIONS

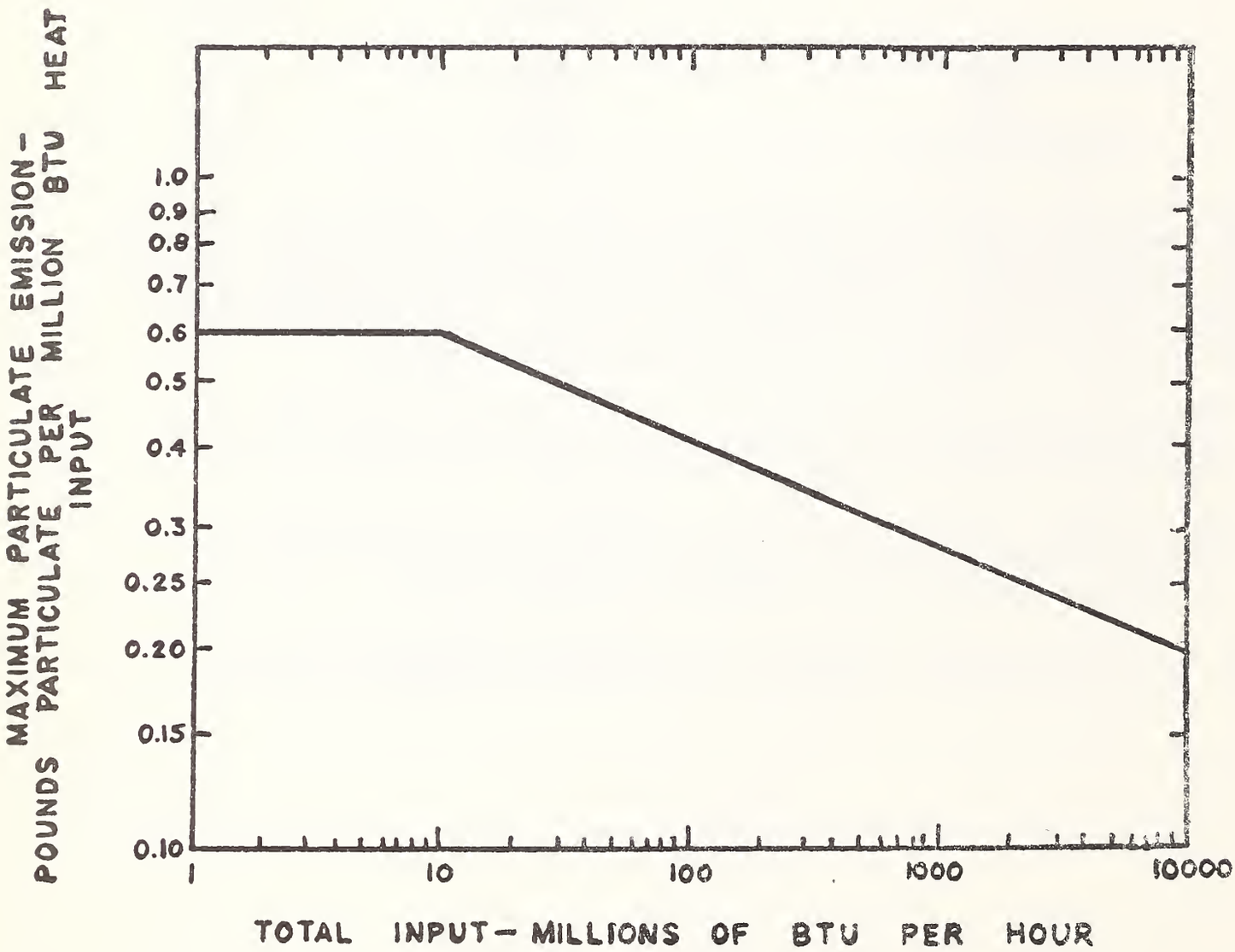
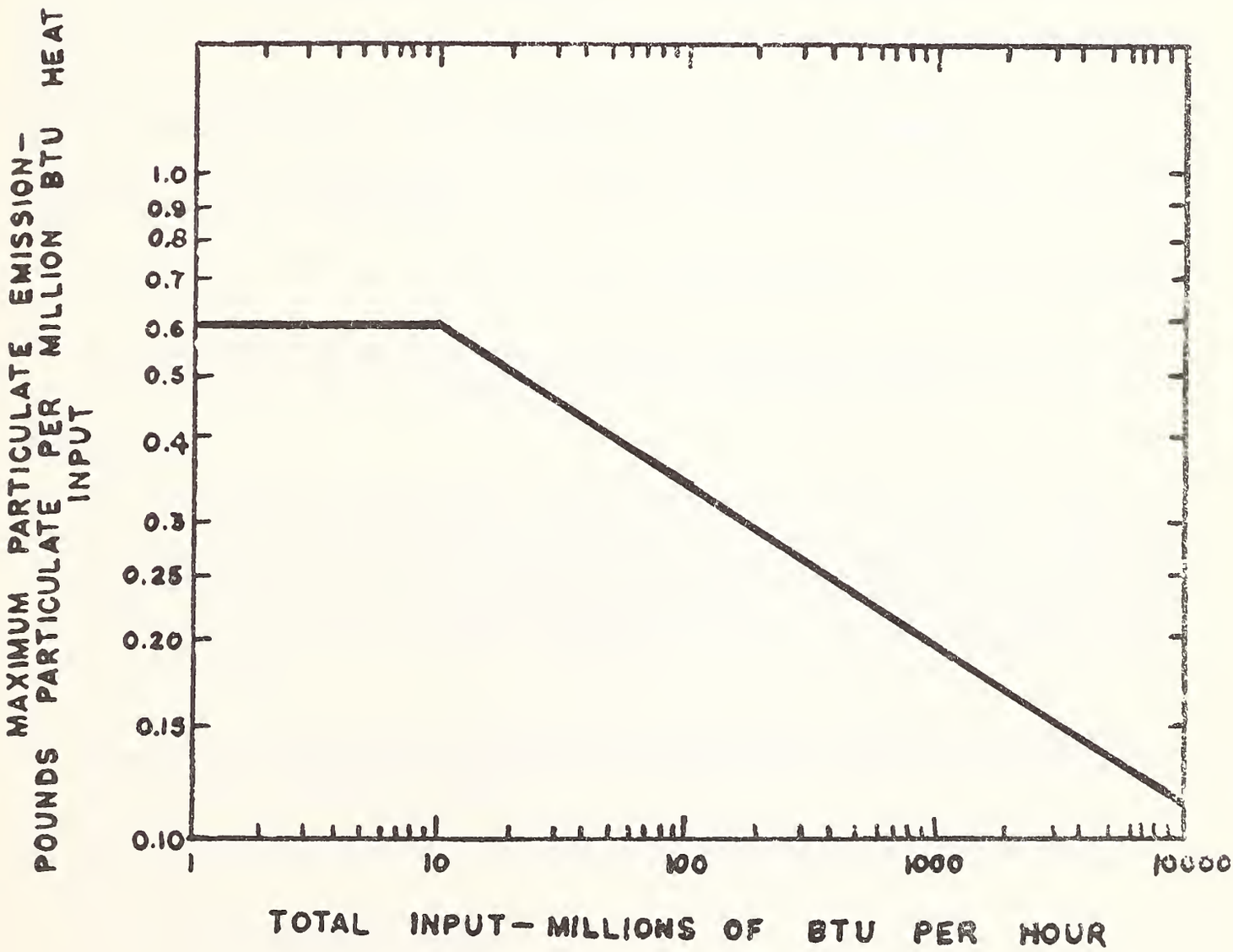


FIGURE 2

MAXIMUM EMISSION OF PARTICULATE MATTER FROM NEW FUEL BURNING INSTALLATIONS



Regulation 90-007

RESTRICTION OF EMISSION OF VISIBLE AIR CONTAMINANTS

A. Restrictions Applicable to Existing Installations

No person shall cause, suffer, allow or permit emissions from any installations which are

1. of a shade or density darker than that designated as No. 2 on the Ringelmann Chart, or

2. of such opacity as to obscure an observer's view to a degree greater than does smoke described in subsection A (1) of this regulation.

This Section A shall not apply to existing incinerators or existing wood-waste burners.

B. Restrictions Applicable to New Installations and All Incinerators

No person shall discharge into the atmosphere from any single source of emission whatsoever any air contaminant.

1. of a shade or density darker than that designated as No. 1 on the Ringlmann Chart, or

2. of such opacity as to obscure an observer's view to a degree greater than does smoke described in subsection B (1) of this regulation.

C. Exceptions

1. The provisions of subsection A and subsection B of this regulation shall not apply to emissions during the building of a new fire, cleaning of fires or soot blowing, the shade or density of which is less than No. 3 on the Ringelmann Smoke Chart or of such opacity as to obscure an observer's view to a degree greater than does smoke designated as No. 3 on the Ringelmann Smoke Chart for a period or periods aggregating no more than four minutes in any sixty minutes.

2. Where the presence of uncombined water is the only reason for failure of an emission to meet the requirements of Sections A or B of this regulation, such sections shall not apply.

3. The provisions of Section A of this regulation shall not apply to the following:

   a. Transfer of molten metals

   b. Emissions from transfer ladles

D. Effective Date

The effective date of this regulation shall be November 23, 1968, with exceptions indicated by Section B (2), Regulation 90-003; Section B, Regulation 90-004; Section C, Regulation 90-006; Section B, Regulation 90-010; Section C and D, Regulation 90-014.

APPENDIX B

Certification from U. S. Plywood and Notations to the Permit

U.S. Plywood

Rocky Mountain Manufacturing, Drawer 7, Bonner, Montana 59823 Telephone 406/258-6161

April 13, 1973

Mr. Donald Holtz, Chief
Air Quality Bureau
Environmental Sciences Division
Department of Health and
Environmental Sciences
Helena, Montana 59601

Dear Mr. Holtz:

Attached is a certification of commitment on the part of U. S. Plywood for assuring compliance with the applicable County, State and Federal laws and standards on air and water pollution control.

We again ask for a permit to complete the construction of and operate our plywood plant and related facilities at Bonner, Montana. We intend to comply with the spirit and not merely the letter of the regulations. We believe that our new plant will make for improved utilization of our timber resources, provide economic growth and that as planned, the facilities will adequately protect the environment.

Very truly yours,

W. E. Butler

W. E. Butler

WEB:bhl

Attachment

April 11, 1973

A notation to the permit for the plywood plant construction at Bonner.

The commitment and program for bringing the U. S. Plywood Bonner Plywood Plant into operation and assuring compliance with the applicable County, State and Federal laws and standards is as follows:

A. The facility will be constructed incorporating the design features and components as described in the statements issued to the State which form the basis for the issuance of a permit. In brief, the special features to limit our impact on the environment are:

   1. Low temperature drying
   2. Bag filters on the pneumatic systems that handle dusting materials.
   3. Closed systems on water portions of process.
   4. Paving on active roads.
   5. Paving of active log handling areas.
   6. Scrubbers on boiler stacks.

B. Upon initial start-up of the facilities, U. S. Plywood shall:

   1. Make full use of the various devices and systems as proposed to limit emissions from the facilities.
   2. Make the proper adjustments for control of dryer emissions taking into account the variables of three veneer species, three moisture content levels and three basic veneer thicknesses.
      a. With initial dryer start-up at approximately 1-1-74, this will require a period of approximately six months

to determine the optimum operating conditions and to make the necessary adjustments.

b. Separate operating parameters will be necessary for each combination of variables within the veneer dryers in order to operate reliably within the required limits of emissions.

3. Make arrangements for all other sources of emissions to be within State specifications with all reasonable speed and not to exceed six months from January 1, 1974.

C. To carry out B. above, U. S. Plywood will:

1. Use state approved procedures for sampling the stacks.

2. Use state approved procedures for reporting.

D. Ambient air quality measurements concerning the U. S. Plywood Bonner facility impact. The State will:

1. Gather air quality data on an expanded basis, consistent with the availability of state facilities, in the interim period before start-up of the plant.

2. Gather air quality data after start-up.

3. Expand program of sampling the meteorological factors.

a. Predictions to be used in calculating the probable effect of the airshed of measured emissions after start-up.

b. To support decisions relative to further permit requests within the airshed.

(1) U. S. Plywood will be submitting a permit application for the construction of a particle-board plant by year end 1973, the above Program

should have accumulated the data so that the permit can be properly evaluated.

E. If it is determined by measurement that U. S. Plywood does not comply within the applicable laws:

1. U. S. Plywood will expeditiously move to come into compliance.

   a. If non-compliance is in the area of the plywood veneer dryer emissions, the correction will take in the neighborhood of 12 months to effect, depending on what correction is resolved.

   b. The type of secondary treatment is not specified at this time so that U. S. Plywood can install the best system available if and when it is determined that secondary treatment is required.

   c. The kind of secondary treatment, if needed, will be determined by:

      (1) Frequency of exceeding ambient air standards.

      (2) Duration of conditions when ambient air quality will exceed standards.

      (3) The latest technology for correction, and energy requirements of the approaches that are available for consideration.

      (4) Approval by the State.

F. If after the six month period to adjust and determine proper operations, the plant is in apparent compliance, the State shall within one year comment on the veneer dryer control concept so as to allow the U. S. Plywood to complete its facility.

Signed: W E Butler
Vice Pres.

APPENDIX C

Comments and Responses to Comments

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1973
ENVIRONMENTAL
DIV.

4 Rosebud Lane
Missoula, Montana 59801
March 13, 1973

Mr. Donald R. Holtz, Chief
Air Quality Bureau
Department of Health and Environmental Sciences
Helena, Montana 59601

Dear Mr. Holtz:

Thank you for sending me a copy of the Environmental Impact Statement on the proposed plywood manufacturing plant at Bonner, Montana.

However, after studying it, I find that I cannot agree with your conclusion that the permit for the proposed facility should be denied on the basis of the material presented in this paper.

The argument is presented that sometimes the air quality in this area already exceeds ambient air standards. There is no doubt about this. If you deny a permit for this reason then it would be just as logical to prohibit all further construction of particulate sources, including home heating plants.

I do not disagree with your plume dispersion calculations, but I do not see how you can apply these to ambient air standards. Ambient air includes all the air through which the particulate is dispersed, not just in the plume during a relatively short time interval. I am sure that under relatively stable conditions you will find that the wind will blow from every quadrant of the compass in the valley at Bonner. Under these conditions the air drainage will be from Bonner into the Missoula valley during the night. With a little heating during the afternoon the flow will reverse to up-valley along the Clark Fork east of Bonner.

In the course of a previous study related to adverse pollution conditions I calculated the volume of the air mass in the Missoula Valley under a 500-foot inversion. It came to 3.578×10^{10} m^3. Using the high mass emission rate of 33#/hr. quoted in your statement, I calculate this to be 3.592×10^{11} ug in a 24-hour period. Assuming that all of this would remain suspended, and that all of this particulate would flow into the Missoula Valley under a 500-foot inversion, it would raise our particulate count by approximately 10 ug/m^3. Under these rare adverse conditions we normally have a particulate load of 300-400 ug/m^3, so the addition of 33#/hr. of particulate, all moving into and remaining in the Missoula Valley during a 24-hour period would raise our particulate count by 2.5 to 3%.

The calculations above assume the worst possible conditions. When we have a persistent 24-hour inversion it will usually rise to 800-1000 feet in the afternoon, doubling the carrying capacity of the air mass. Very often when the Missoula area is under a fog blanket, Bonner will have only patches of morning fog with bright sunshine most of the day. Because of the channelling effects of the valleys near Bonner, I am sure that you will find the wind stronger on the average than at the Missoula Airport and the present particulate background much less than at the Missoula County Courthouse.

Because of the minimal effect the installation of this plant would have on our ambient air, I urge you to reconsider your decision on the U. S. Plywood Company's installation permit. I am confident that this company will utilize the most modern devices available to control emissions.

The above opinions are strictly those of the undersigned.

Sincerely,

E. W. Nelson

E. W. Nelson
Member, Missoula Air Pollution Advisory Council

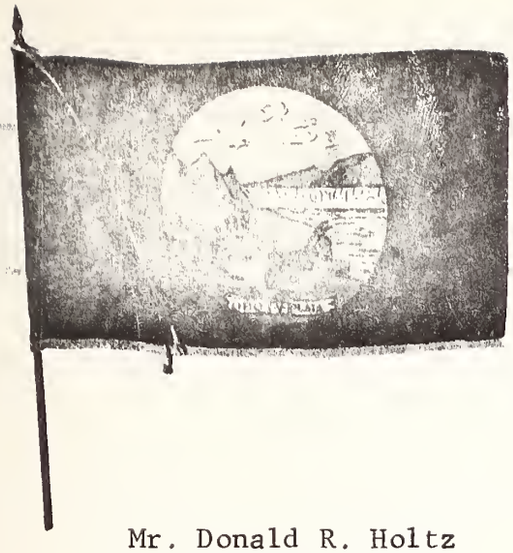
cc: Dr. Kit Johnson, Missoula County Health Officer
Mr. J. R. Stevenson, Chairman, Missoula APAC
Dr. Grover Hulla, Missoula County Health Board

Responses to Comments of E. W. Nelson

Paragraph 4 - The modeling provides an indication of the effect of stack emission on the ambient air at specific locations. All ambient air obviously cannot be analyzed, only a very small fraction of it. Ambient air monitoring is intended to gather data representative of a larger situation.

Paragraph 5 - The statement is not particularly concerned with the effects of the emission on Missoula air quality. Rather, we have restricted consideration to the Bonner area, where the effects will be most pronounced. See also Section III, B, 3.

Paragraph 6 - Monitoring is presently being done, will continue to be done, in regard to the area's meteorology. See also Section III, B, 3.



THOMAS L. JUDGE
GOVERNOR

STATE OF MONTANA
DEPARTMENT OF HIGHWAYS

HELENA, MONTANA 59601

H. J. ANDERSON
DIRECTOR OF HIGHWAYS

March 14, 1973

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1973
ENVIRONMENTAL SCIENCES
DIVISION

Mr. Donald R. Holtz
Air Quality Bureau
Department of Health and
Environmental Sciences
Helena, Montana 59601

Dear Mr. Holtz:

Reference is made to your letter of March 2, 1973, and the attached Draft Environmental Impact Statement on the proposed plywood manufacturing plant to be constructed at Bonner, Montana, by U. S. Plywood-Champion International.

The proposal has been reviewed. However, due to the omission of information relating to possible impact on highway systems, we are unable to adequately review the statement. More specific information is required in the following areas:

1. The statement does not provide a detailed description or map relating exactly where the plant will be located in relation to existing facilities. Mention was made of plumes of vapor decreasing motorist visibility on adjacent roadways. We are unable to consider the possible adverse impact until the plant location is specified.

2. No evaluations were made in regard to the types of transportation systems to be used or what their possible impact on existing systems might be.

3. What affect will the transportation needs of 500 plant employees have on the existing traffic pattern?

Thank you for including us in your review process.

Very truly yours,

H. J. ANDERSON
DIRECTOR OF HIGHWAYS

30:GOP/IBJ/pi

cc: I. B. Jensen

By Grover O. Powers by Bonnie
Grover O. Powers, P.E.,
Supervisor - Preconstruction Section

GEORGE VUCKOVICH, VICE CHAIRMAN
WM. M. KLOSNER, VICE CHAIRMAN BLACK EAGLE
G. R. COONEY BUTTE
P. L. BACHELDER BILLINGS
JAY LA CROIX
JOHN D. WHEELER, SECRETARY

Responses to Comments of Montana Department of Highways

Comment #1 - See Section II, A, and III B, 3

Comment #2 - See Section II, A

Comment #3 - See Section III, C, 2

RECEIVED

MAR 28 1973

ENVIRONMENTAL SCIENCES
DIVISION

TO: State Department of Health and Environmental Sciences, Environmental Sciences Division, Air Quality Bureau, Helena, Montana

REF: Environmental Impact Statement on the proposed plywood manufacturing plant at Bonner, Montana, March 2, 1973.

The Missoula City-County Air Pollution Control Board:

1. Endorses the intention and most of the conclusions of the environmental impact statement to safeguard the ambient air quality in the Bonner area; however, we question the validity of the particulate dispersion model and its conclusions.

2. Accepts the intent of U. S. Plywood-Champion International to comply "with the spirit and not merely the letter of environmental quality standards" through their plans for the Bonner plant as confirmed by their representatives at a meeting with the Missoula City-County Air Pollution Control Board on March 15, 1973.

3. Therefore, recommends that U. S. Plywood-Champion International be allowed to build and operate the proposed plant at Bonner with the absolute provision that they will comply with all present and future national, state and local standards relative to this plant's air pollution emissions; including secondary treatments for veneer dryer emissions if necessary.

Grover Hulla, M.D., Chairman
Missoula City-County Air Pollution Control Board

Response to Comments of Miccoula City-County Air Pollution Control Board

Responses to these comments are contained in Section III, D and Appendix II.

Environmental Quality Council

Gov. Thomas L. Judge
xxxxxxxxxxxxxxxxx

March 29, 1973

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1973
ENVIRONMENTAL HEALTH SCIENCES
DIVISION

Dr. John S. Anderson, Director
Dept. of Health and Environmental Sciences
Helena, Montana

Attention: Mr. Donald R. Holtz

Dear Dr. Anderson:

We have received and reviewed your draft environmental impact statement for the proposed plywood manufacturing plant (U.S. Plywood - Champion International) at Bonner, Montana. Our office has no comment on the draft.

We understand there is some question as to whether or not a permit will be issued depending upon whether or not additional information supplied by the applicant or acquired by your Air Quality Bureau will show conclusively that ambient air standards will not be exceeded. We would appreciate being informed of your department's decision on this matter as I'm sure would any others who responded to the draft.

Thank you for your efforts toward compliance with the Montana Environmental Policy Act.

Sincerely yours,

FLETCHER E. NEWBY
Executive Director

By Loren L. Bahls
Loren L. Bahls, Ph.D.
Staff Ecologist

FEN/LLB/mb

cc: Dan Vichorek

STATE OF MONTANA

DEPARTMENT OF

FISH AND GAME

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1973

ENVIRONMENTAL SCIENCES
DIVISION

Helena, Montana 59601
March 30, 1973

Mr. Donald R. Holtz, Chief
Air Quality Bureau
Department of Health and Environmental Sciences
Helena, Montana 59601

Dear Don:

Enclosed is a memo from our regional office at Missoula concerning the proposed plywood manufacturing plant at Bonner, Montana. As you will note when reviewing this memo, there are some basic questions we would appreciate having answered - particularly those relating to the water used in various parts of this manufacturing process and its ultimate fate.

We are also concerned about the impact of 500 new families, both from the sewage disposal facilities planned for the plywood plant, and from the ability of Bonner or other communities to absorb this population growth with existing environmental control facilities.

Any information you can offer on these topics would be greatly appreciated.

I hope our comments will be of use to you.

Sincerely,

JAMES A. POSEWITZ, ADMINISTRATOR
ENVIRONMENT AND INFORMATION DIVISION

JAP/sd
Enc

cc: Fletcher Newby
R. A. Rothweiler

STATE OF MONTANA

DEPARTMENT OF FISH AND GAME

HELENA, MONTANA

Office Memorandum

TO : Wes Woodgerd Attn: Jim Posewitz **DATE**: March 26, 1973

FROM : Jim Ford By : R. A. Rothweiler

SUBJECT: Comments on the Environmental Impact Statement, Proposed Plywood Manufacturing Plant, U. S. Plywood Champion International, Bonner, Montana

The Environmental Impact Statement was prepared by the Air Quality Bureau of the Department of Health and Environmental Sciences. The EIS puts emphasis on possible air pollution of the environs at Bonner resulting from the operation of this facility.

I do have a comment about the present Montana air pollution standards. I quote from the EIS, page 5, "Montana's present regulation specifies a visible emission not to exceed 20% opacity. The other regulation applicable to the veneer dryers is the 'process weight law.' This law specifies the amount of particulate matter that can be emitted to the atmosphere and is based on the quantity of material processed." With my provincial logic it appears that the more products you produce the more air pollution you are allowed. The only limitation is in the size of your facility.

Most of the information concerns the emission of particulate matter (in this case gaseous hydrocarbons, hemi- and mono-terpines). And how to dissipate these particulates without causing excessive impacts on humans, wildlife, plants, etc. Available data suggests few of these compounds are considered toxic. The Statement indicates very little data is available regarding their effects on plants and animals. They do indicate these compounds are emitted from growing vegetation; the blue haze seen in the mountain valleys in early mornings is created by these gaseous hydrocarbons. Nothing is said about the concentration of these compounds from a living forest and concentrations from this proposed facility. I think we should have a resume of a possible problem resulting from the emission of these compounds. My main concern is the water in the rivers in the vicinity of the plant. There may be a remote chance that these compounds could concentrate in the waters of the Blackfoot and Clark Fork Rivers with a resultant effect on the fisheries.

I have a number of questions concerning the effects on surface and ground waters.

Quote from EIS, "Logs are sawed in the woods and transported by truck to the facility in Bonner. Here they are held in storage under sprinklers to control stain and checking. The water is recirculated and will require makeup rather than creating any waste discharge. The storage area will have concrete

ribbons for mobile equipment and there will be a concrete sump for water drainage from the sprinkler system." Will these concrete ribbons be for mobile equipment only or will all logs used for veneer be stored on concrete? If the logs are not to be stored on concrete can we anticipate the seepage of sprinkler waters into ground waters? If the waters are all to be collected in a concrete sump, will this water be returned to the Blackfoot River? And in what condition? What water treatment systems will be provided to keep silt, detritus and other contaminants out of the river?

Quote from EIS, "The logs chosen for plywood manufacturing will then be conveyed to hot water vats where they will be held for about 2½ hours to soften the wood for better peeling mechanics and veneer quality. The hot water vats will be concrete structures filled with steam-heated water. The vats will be roofed to minimize fog which could otherwise be present near the water surface during cold weather. A certain amount of vaporization will occur; however, this is expected to be minimal. The hot water system will also require makeup and the waste water will be reused as makeup for the sprinkler system. Solid wastes from the vat cleanup will be used for boiler fuel." The statement indicates this hot water system will require makeup and that waste water will be used in the sprinkler systems. Can we anticipate that this water will be returned to the Blackfoot River? And again if so, what is the condition of that water?

U. S. Plywood Champion International intends to control hydrocarbon emission by using controlled low temperature drying with provisions for extra control if necessary. Three possibilities were considered: controlled low temperature dryers, wet scrubbers, and filter systems. The controlled low temperature drying system appears to be the most desirable type of control. However, a model worked up by the Air Quality Bureau indicates that emissions under this system would exceed ambient air standards. It may be necessary to use a combination of low temperature dryers and wet scrubbers.

Quote from EIS, "The wet scrubbing system is presently being evaluated at a location in Seattle, at one of the applicant's plants there. This system involves collecting the exhaust gases from the dryers, bubbling them through water and then out the stack after passing through a mist eliminator to remove water condensables. The water solution then must be treated to remove the trapped hydrocarbons and this can tend to generate a water contamination problem. However, the system itself is fairly effective (75%-80% collection) and experimentation is being done now to alleviate some of the maintenance problems caused by having sizeable quantity of hydrocarbons suspended in the water." My questions concerning this wet scrubber system - will the water from a wet scrubber be returned to the Blackfoot River? Another company in the vicinity of Missoula utilizes a scrubber system with combination of settling ponds. From the standpoint of fisheries, this existing system is unsatisfactory - especially when these settling ponds have to be dumped. Can we anticipate that this facility will utilize this same system? Our main concern is keeping the hydrocarbons out of the river. Can we anticipate contamination of the Blackfoot River, and eventually the Clark Fork River from the construction of this facility? I feel that if a system of low temperature

dryers and scrubber systems is to be used, then a new Environmental Impact Statement should be prepared to cover the impact to the river waters flowing by the plant.

One other question that has not been answered in the EIS - when completed and put into operation this plywood plant would employ over 500 people. This equals the population of many small towns in Montana. Are sewage facilities provided to take care of the needs of this many people?

The following is a quote from the U. S. Plywood Champion International policy on the environment: "It is the policy of Champion International to recognize constructively the public interest in our natural resources and the quality of the environment in the areas in which the company operates. Operation in both the forest and the manufacturing plants will be carried out with the spirit and not merely the letter of environmental quality standards and company timber lands will be managed to assure accepted conservation practices and sound multiple use."

I think we ought to take them up on this.

Rocky

RAR:fn

Response to Comments of Montana Department of Fish and Game

Paragraph 2 - See Section III, D and Appendix I, Regulation 90-004

Paragraph 3 - To our knowledge, no such effects as mentioned here will occur. Contamination of rivers is not expected to occur

Paragraphs 4 and 5 - See Section II, D and III, C, 4.

Paragraph 6 - The wet scrubbing system is discussed in the Alternative Section. Also, indications are that the discharge from such scrubbers is easily treatable. The State is investigating the efficacy of this type of control.

Paragraph 7 - A discussion of population effects is contained in Section III, C, 2.

MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

THOMAS L. JUDGE, GOVERNOR
GARY WICKS, DIRECTOR

MEMBERS OF THE BOARD
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449-3647
SAM W. MITCHELL BUILDING
HELENA, MONTANA 59601

1973
ENVIRONMENTAL SCIENCES
DIVISION

March 30, 1973

Air Quality Bureau
Environmental Sciences Division
Montana State Department of Health and Environmental Sciences
Cogswell Building
Helena, Montana 59601

Dear Sir:

We have reviewed the draft environmental statement and feel strongly that based on the air quality data presented, the project proposal needs to be re-evaluated both by U.S. Plywood and the Department of Health and Environmental Sciences. We further suggest that this re-evaluation result in resubmission of this draft statement if this proposal is materially altered. Until such time as it can be reasonably ascertained that the proposal will not exceed the established state and federal air quality standards, a construction and operating permit should not be issued.

The construction and operation of the proposed plywood plant at Bonner would be an addition to U.S. Plywood's extensive sawmilling plant already established at Bonner. We feel that the existence of this facility at Bonner should be specifically acknowledged in this statement as it is one of the major sawmills in western Montana cutting in excess of 100 million board feet of sawtimber each year. Also, the existence and continued operation of this sawmill has a direct influence on the primary and secondary environmental impacts which will result from the plywood plant proposal. We feel that this statement is both incomplete and inadequate in this regard.

Contrary to the statement found in the summary that "timber cut will not be increased over the previous owners operations" and that the statement found on page 20 "U.S. Plywood contemplates no changes in their timber cut, so there will be no changes from the present in this environmental situation," the timber harvest from company owned lands is projectd to increase from around 140 MMBF to approximately 200 MMBF per year. This information has been public knowledge for some time and the above quoted statements and any conclusions drawn therefrom by the Department of Health and Environmental Sciences appear incorrect.

We feel that Section V "Relation between short term uses of the environment and long term effects" more properly should include a discussion of the ability of the forest resource to support over the long term the increased annual harvest this new plant and the other existing facilities at Bonner will require.

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We hope the above comments prove helpful and appreciate the opportunity to comment on this statement.

Sincerely,

Lawrence M. Jakub

LAWRENCE M. JAKUB
ASSISTANT FOR ENVIRONMENTAL
AND LEGAL AFFAIRS

LMJ/nw
cc: Gary J. Wicks, Director, DNR&C
Gareth C. Moon, Administrator,
Division of Forestry, DNR&C

Response to Comments of Montana Department of Natural Resources & Conservation

Paragraph 1 - The proposal has not been materially altered. The decision was changed on the basis of better data and better commitments by the applicant.

Paragraph 2 - The extent of the sawmilling portion of that plant will be considerably reduced, but it will continue to be one of the major facilities of this type in the state.

Paragraph 3 - See Section II, A.

Paragraph 4 - See Sections II, B, 2, and V.

STATE OF MONTANA
DEPARTMENT OF INTERGOVERNMENTAL RELATIONS

PLANNING AND ECONOMIC DEVELOPMENT DIVISION
MAIL TO CAPITOL STATION, HELENA, MT 59601

THOMAS L. JUDGE
GOVERNOR

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ENVIRONMENTAL SCIENCES
DIVISION

March 30, 1973

Mr. Donald R. Holtz, Chief
Air Quality Bureau
Department of Health and
Environmental Sciences
Capitol Station
Helena, MT 59601

Dear Mr. Holtz:

Reference is made to the environmental impact statement for the proposed plywood plant to be built by Champion International at Bonner, Montana. We did review this draft and wish to make the following comments.

At one place in the draft there are some statements we find confusing. It is not made clear in what sense the phrases "short-term" and "long-term" are used. It is stated, for example, that the economic benefits of increased employment will be "short-term" --a period presumably equal to the life of the plant. But particulate emissions to the plant environment are considered "long-term," suggesting that they will persist beyond the life of the plant. If this is indeed the supposition, no evidence is given to support it and this should be supplied; otherwise it should be made clear why the employment benefits should be regarded "short-term."

We are not knowledgeable in the field of atmospheric diffusion models and therefore cannot comment on the technical aspect of the report. It would appear, though, that perhaps a wider circulation of the EIS could have been made to individuals for review who are knowledgeable in this field.

Not noted in the statement are the very substantial benefits to the economy of Montana if this plant is constructed. The discussion regarding whether or not trees should be cut, and the speculations as to what the writer considers "unwise use" of plywood by those who may buy the plant's products is immaterial to the issuance of a permit for this operation; but the raising of these questions invites conflict between opposing

interests. It appears clear to us that the applicant does intend to comply with state regulations, and has acted in a positive and cooperative manner. So long as state and federal laws and regulations are met, a permit should be issued.

Sincerely,

Harold M. Price, Chief
Community Development Bureau

HMP/rmm

Response to Comments of Montana Department of Intergovernmental Relations

Paragraph 1 - See Section VII

Paragraph 2 - The final statement has been distributed as suggested

Paragraph 3 - Discussion of such subjects as timber harvest and wise use of resources is indeed immaterial to issuance of the permit and does invite "conflict" between opposing interests. However, one purpose of the impact statement is to provide a forum for such discussion, even though this agency or any agency may have no authority to take any action regarding the subject.

MATHEMATICS DEPARTMENT

University of Montana
Missoula, Montana 59801
(406) 243-0211

March 30, 1973

Mr. Benjamin F. Wake, Administrator
Montana Department of Health
and Environment Sciences
Environmental Sciences Division
Helena, MT 59601

Dear Mr. Wake:

We are taking this opportunity to make some comments about the draft environmental impact statement, prepared for a proposed plywood manufacturing plant to be constructed at Bonner, Montana, by U.S. Plywood-Champion International.

We note, with some concern, that ground level particulate concentrations could attain levels of 396 $\mu g/m^3$ for 24 hours in the event there are stable conditions (class E) with 2 in/sec. wind speeds. Since maximum ground level concentrations are usually connected with class D stability and light to moderate winds[1,2], it appears very likely the proposed plant will exceed the Federal and State air quality standards.

Another source of concern is that no mention is made of the fact that Bonner school is located at a critical distance for receiving maximum ground level concentration from a number of the proposed stacks. Although very little data is available concerning the toxicity of the terpines the plant will emit, they are similar in structure to cyclohexene and turpentine for which 8-hour occupational exposure levels have been set. We submit that children attending Bonner school will be subject to the threshhold limit values while at school, and the majority will receive additional exposure during the remainder of the day, since they reside within 2 km. of the proposed plant.

---

[1] R. B. Lantz, E.P.A. hearing on New Mexico implementation plan, Sept. 6, 7 (1972).

[2] F. W. Thomas, Discussion of plume rise, Atmospheric Environment, 1 (1967) 426.

According to our information, U. S. Plywood is planning to cut down on dust particulates, rather than these toxic hydrocarbons in order to meet State standards. We feel this effort is misplaced for it is the terpines that have the greatest potential for damage.

Since the dispersion model used by the Air Quality Bureau has been verified to be reasonably accurate in calculating the ambient particulate concentrations at short ranges (up to 10 km.), we believe your agency should deny the permit for the proposal as submitted in the draft. Furthermore, U. S. Plywood should be encouraged to consider alternatives which eliminate the volatile hydrocarbons.

Sincerely,

Robert McKelvey

Robert McKelvey
Professor of Mathematics

William R Derrick

William Derrick
Associate Professor of Mathematics

Robert Bohac

Robert Bohac
Assistant in Mathematics

vh

Response to Comments of University of Montana Mathematics Department

Paragraph 2 - See Section III, B, 3

Paragraph 3 - See Sections III, A, 3 and III, B, 3. The concentrations in stack gas emission (150 ppm) will be diluted by several orders of magnitude at the school

Paragraph 4 - While not explicitly stated earlier, low-temperature drying will reduce the vaporization and volatilization of all hydrocarbons, including the volatiles.

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
FEDERAL BUILDING MISSOULA, MONTANA 59801

TELEPHONE: 549-6511
AREA CODE 406

1940
April 6, 1973

Mr. Donald R. Holtz, Chief
Air Quality Bureau
Montana State Department of Health
and Environmental Sciences
Cogswell Building
Helena, Montana 59601

Dear Mr. Holtz:

We have reviewed the environmental statement on the Proposed Plywood Manufacturing Plant at Bonner, Montana, and have only one comment. There was no reference to emissions from boiler operation. We are wondering if any effects are anticipated and what steps would be undertaken to minimize any adverse effects.

Thank you for the opportunity to review and comment on this document.

Sincerely,

Ruth M. Thompson

for STEVE YURICH
Regional Forester

Response to Comments of USDA Forest Service

Additional information on boilers has been included in Sections II, B, III A, 1, and III, D.

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ENVIRONMENTAL SCIENCES
DIVISION

500 Daly
Missoula, Mont. 59801
March 7, 1973

Don Holtz, Chief
Air Quality Bureau
Cogswell Bldg.
Helena, Montana 59601

Dear Mr. Holtz:

We strongly support your thorough testing of U.S. Plywood's environmental impact statement for the plywood plant to be built in Bonner.

There is no way that three wood products plants which would pollute at all could meet state standards if built together in the Bonner Valley. We know that the small air shed of the Bonner Valley cannot deal with the effluents that will be produced by a huge plywood plant, a particle board plant, and a saw mill. The sander dust sources, steam sources, boilers, and chip piles will not be adequately handled to eliminate pollution. The technology is not yet available to control pollution from veneer dryers. The result of allowing the complex to be built in that valley will be pollution by smog and fog to a deplorable degree. Furthermore, any degree of air pollution will be concentrated by the stagnant air of the small Bonner valley.

We are not satisfied by U.S. Plywood's environmental impact report. It is vague in some places and the suggestions are inadequate in other places. We urge that all three parts of the complex be required to establish and maintain the highest standards for clean air. We further urge that all of the complex not be built within the small Bonner Valley. This would allow for better pollution dispersion without any job loss.

Sincerely,

Peg Schaefer

Margaret E. Schaefer, Ph.D.
Chairman, GASP

cc. Missoulian

500 Daly
Missoula, Montana 59801

April 12, 1973

Mr. Don Holtz, Chief
Air Quality Bureau
Cogswell Building
Helena, Montana 59601

Dear Mr. Holtz:

The purpose of this letter is to present the decisions of the members and supporters of GASP with respect to the construction of a plywood plant of U.S.-Plywood-Champion International in Bonner, Montana.

First, we do not believe any of the many oral promises made by officials from the company that the plant will be non-polluting. We have well-founded basis for this criticism. Not the least of these is that we find the same promises being made for this plant as we have heard before -- never in writing, always in orally-presented speeches given to inform the public. I quote from the Missoulian and the Montana Business Quarterly:

-- The plant was described as the very latest in design with virtual elimination of undesirable water and air pollution.

-- The plant's operations will be practically a closed system.

-- No appreciable amount of stream or air pollution will be encountered.

-- . . . has already spent several hundred thousand dollars in equipment aimed at reducing odors.

Sound familiar? Well, these are remarks made orally by members of the Hoerner-Waldorf Corporation before and after the pulpmill began functioning. Everybody knows what that plant has done to the Missoula valley. So much for empty, verbal promises.

Now, some fifteen years later we are hearing the same words from a member of another nationally-known company. Should we believe them now? No! These verbal promises are empty and worthless. We are not finding U.S. Champion guilty of the sins of Hoerner-Waldorf. We are merely being rightfully critical in assessing this new set of promises.

Again, we hear that the company will "recognize constructively the public interest in our natural resources and the quality of the environment in the areas in which the company operates." That, "operation in the manufacturing plants will be carried out within the spirit and not merely the letter of environmental quality standards."

These statements came from the same officials who profess amazement at publication of an impact report by the State Air Quality Bureau. How can we doubt? -- especially after hearing from Mr.s Butler and Hyatt that the plant will be the very latest in design with virtual elimination of undesirable water and air pollution -- that it will be practically a closed system -- that there will be no appreciable amount of streamt or air pollution -- that the company has planned for many thousands to be spent on pollution abatement equipment -- that they will spend any reasonable amount necessary for control equipment. After all, they are pledged to be within the spirit and not merely the letter of the law.

More specifically: although the company will use thousands of gallons of water, none will return to the river. None? Really? Instead, most of it will be vaporized, endowing the narrow Bonner Valley with a blanket of fog and the concomittant modifications in weather patterns.

Although the company plans on using a boiler that already exceeds state standards, the company states that the stacks will be kept clean by good control of fuel, fires and scrubbers. How long will it take to get the old boiler shut down and a new one built? The company claims it will have to wait until the particle board plant is planned. This assumes, of course, that both the plywood plant and the particle board plant will be built and still meet the spirit and the letter of environmental quality standards. Meanwhile the old boiler is burning away, smogging up the valley. What will the addition of 18 stacks do? What is a stack for but to belch an effluent into the air? . . . But, according to U.S.-Champion the effluent will be clean...like the boiler effluent is clean?

For the venner dryers, the company plans to use a lower temperature than Van Evans but they will not use a scrubber. Since the plant will be bigger than the Van Evan plywood plant in Missoula, even at the lower temperatures the cumulative amount of pollution from their dryers will be significant. And it will be difficult to disperse in a narrow valley, which is subject to stagnant air inversions. Are we to believe that there really will be no sand or dust blowing, no excess boiler fuel piles stacked outside and waiting for the wind, no dust from roads within the complex and among the log piles as the trucks come lumbering through? Do you believe it? We don't.

If we decide to take as gospel these declarations from the company, then we can consider the state's environmental impact report --because it is based on the assumption that all these promises are valid ones; it is very generous. It is extremely conservative in testing the real amount of pollution that the plant will be emitting. Yet, even these assumptions show that the plant will not be able to meet state standards. We support the environmental impact report as done by the Air Quality Bureau. However, we do emphasize that this report assumes that the plant as a whole will be operating under the ideal conditions promised.

Moreover, throughout the report, it is stated that there is not sufficient information to make statements about some aspects of the pollution question. This brings us back to our familiar plea with the state and county health departments. It is for situations EXACTLY like this that we need background information. For this reason, we need the air monitored continuously, for a variety of materials. Of course, we have made no headway. Late in 1972 and early

in 1973, too high volume samplers were put in the Bonner Valley to begin this background. These are cleverly placed near dirty roads. High volume samplers are used to collect samples which are then weighed. Road dust weighs a lot. Small particles, such as are emitted by veneer dryers, do not. The samplers are presently measuring loads of road dust. If and when the plant begins to function, they will be measuring road dust plus effluent. However, the latter will be masked by the former. This is because a piece of dust weighs a lot; a small particle pollutant does not. One piece of dust can weigh as much as 5,000 small particles. So, in order for the new effluents to register, there would have to be up to 5000 times as many particles to weigh as much as a grain of dust. The dust variation will be daily as well as seasonal; the effluent will be constant. Will it even show up against the background of road dust when measured with a high volume sampler? So, are we using the appropriate instruments to gather the background for this case? We don't think so. It looks like another case of inadequate measures taken too late to be effective. Another blunder that will pay off to the polluter.

We support the environmental impact report presented by the state Air Quality Bureau. We don't think the state of the air is at the level where a veneer dryer, of any kind, can be put in the Bonner Valley without exceeding Montana's standards for clean air.

Sincerely,

Margaret E. Schaefer

Margaret E. Schaefer, Ph.D.
Chairman, GASP

Response to Comments of GASP

Comment #1 - The state believes that state standards can be met. Discussions of the various items mentioned is included in Sections II, B, III, B, 3, and III, D.

Comment #2, Paragraphs 1-6 - The certification by U. S. Plywood, the conditions to be attached to the permit, and the results of further testing and modeling all strongly indicate that standards will be met. Further, should certain standards not be met, we feel that the commitments are more than "empty and worthless verbal promises," and that adequate legal remedies are available should the need for them arise. See also III, D, and Appendix B.

Paragraph 7 - See Sections III, A, 4, III B, 5, and III C, 4.

Paragraph 8 - See Sections II, B, III, A, 1, and III, D.

Paragraph 9-10 - Responses to these comments are contained through the impact statement.

Paragraph 11 - Sampling has been and will be further expanded. The samplers were not "cleverly placed near dirty roads." True, they were located near roads under less than ideal conditions, but road dust contributes considerably to suspended particulate in the ambient air. The statements regarding particle sizes and numbers of particles are generally quite true, but irrelevant to the current situation. Small particles contribute significantly more to visibility reductions and adverse health effects than larger particles of the same type. Further, no statements have been made regarding the particle sizes of the effluent in question. In fact, there is a possibility that the hydrocarbons may revolatilize and no longer be a particulate shortly after its emission.

If the effluent does not appear in high volume sampling results (the method necessary for determination of total suspended particulate), then, technically, it does not contribute to total suspended particulate readings.

University of Montana
Missoula, Montana 59801
(406) 243-0211

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ENVIRONMENTAL SCIENCES DIVISION

Department of Geology

April 11, 1973

Donald R. Holtz, Chief
Air Quality Bureau
Department of Health and Environmental Sciences
State of Montana
Helena, Mt. 59601

Gentlemen,

A copy of the draft report entitled "Environmental Impact Statement on the proposed plywood manufacturing plant at Bonner, Montana" dated March 2, 1973, has come to my attention and, although I am not on the distribution list for this document, I feel that the significance of your work is so extraordinary as to deserve much wider analysis and comment than you may have intended. Thus, I am making the following comments as a private citizen overseeing graduate student research in the Bonner Area related to land use planning. I have been involved in this effort for the past two years and am supported by Federal Water Resources Research allocation funds to this state. I note that very few persons involved in land use planning in the region were afforded copies of this document or opportunities for comment. At the very minimum the Western Montana Planning Group, the City and County Planners and associations, and the local Blackfoot planning groups as well as those of us working in the University on resource and land-use planning should have received copies. Additional copies could have gone to the utilities and public service commissioners who must insure adequacy of power and other utility services to this development.

I feel that the work you have done on effluent from the proposed plant is lacking in the areas of water vapor effects and water disposal effects. Particularly disturbing is your lack of analysis in the area of meteorological physics; and I wonder if this lack may also become apparent in other more serious and far-reaching environmental impacts that your office is now analyzing. I do understand that Frank Dunkle has done work on some phase of water impacts for this site and would hope for equal public review time for the adequacy of his work before preparation of a final statement. Since you have suggested that the permit not be granted for this proposed plant, I am sure that public review time should be available. The following comments are made in the hope that they may [illegible] you in developing adequate tes[illegible] procedures for insuring minimization of impact [illegible] the proposed Bonner operations.

Water vapor:

You state [illegible] draft statement, [illegible] 16) "Water vapor emissions will have some effect on the frequency and severity of fog occurences. A conser[illegible]ve e[illegible]mate of wate[illegible] vapor emissions [illegible] 21 [illegible] hr. with a maximum of 107,000 [illegible] We do not know [illegible] ef[illegible]t this wi[illegible] [illegible] you assume that the effects will not have publ[illegible] he[illegible] conseque[illegible] [illegible] justified in "not knowing" these effects. My [illegible] u[illegible] standings o[illegible] meteorology suggest that there are indeed very [illegible] effects; much more significant from the public health point of view than [illegible] [illegible]ions to which you devote the bulk of your impact statement. If you rea[illegible] do not [illegible] these effects, I believe you should investigate them and find out or ut[illegible]ze research from other areas to attempt to model those effects with the Bonner sub-airshed.

Very simply, 107,000 pounds per hour of water vapor is equivalent to 12,000 gallons per hour. During much of the year, the assimilative capacity of the air over Bonner is adequate to accomodate this volume of water. Mean annual pan evaporation in the region is probably on the order of 2 to 20 inches. This would be equivalent over the slightly-greater-than 1 square mile area of the Milltown-Bonner sub-airshed to about 35-350 million gallons assimilative capacity per year. Twelve thousand gallons per hour is equivalent to 106 million gallons per year which is in the range of natural evaporative capacity.

However, I am sure that you must realize that natural evaporation occurs in this area of extensive open water and that actual evaporation may approach potential evaporation so that the addition of a quantity of water vapor approximately equivalent to the total potential evaporation load will indeed have considerable climatic effect.

The most serious effect of the water vapor emissions, however, is not to be found through analysis of mean annual data. The real impacts come during the winter months when the assimilative capacity of the airshed is zero and solar energy input is low. With a cold near-saturated air mass, <u>any</u> addition of water vapor directly into the air mass will greatly increase the energy necessary to heat or overturn that air mass. One could assume, for instance, a five day inversion period with vapor additions of 107,000 pounds per hour to account for an addition of 535,000 pounds of water vapor to the samll air volume. Much of that water vapor is steam or small ice particles or aggregates thereof as has been well studied in the Fairbanks, Alaska, area over coal-fired power plants. On the order of 120 billion calories of additional heat would be required above that amount necessary to heat the air mass to break the inversion. In that time, incident solar radiation to the top of the air mass trapped in the narrow mountain valley would probably be on the order of 10^{12} calories, most of it reflected away so that one could predict that the additional loading by water vapor will have a significant effect on the duration of temperature inversions in the valley. This would be particularly so should ice fog conditions occur during a long inversion.

We can see in the Missoula Valley that lengths and frequency of conditions associated with inversions increased during the 50's and 60's. Hoerner-Waldorf's water emissions from its stacks <u>before</u> Phase II were reported by the company to be on the order of 176×10^7 gallons per year, or only one order of magnitude greater than Bonner's in an airshed that is about 200 times as large. Thus, we might expect Bonner's water vapor effects to be 10-20 times as great as Hoerner-Waldorf's - which, to the best of my knowledge, you have still not assessed.

Thus, it is not the total volume of water vapor predicted to be released by the Bonner Mill that is potentially damaging, but the fact that this water is to be released in the wintertime without accomodation to the assimilative capacity of the valley. The health effects to be expected are a compounding (and invalidating) of the results you predict for air pollution from other stack components due to increased duration and frequency of inversion conditions.

<u>Waste water</u>:

The second major point of inadequacy that I detect in your proposed Impact Statement is in the area of water disposal. The company proposes to use on the order of 1650 gallons per minute (99,000 gallons per hour) (your statement, p. 18) not to mention potentially large storm runoff, yet plans to release none of it to the river and but 12,000 gallons per hour to the atmosphere maximum. This leaves a quantity of water 87,000 gallons per hour or more unaccounted according to the data you present -

yet you nowhere question or explain what is to become of this. The region's drinking water is almost entirely derived from wells and some of these wells are today going dry in the West Riverside area. If the fluid wastes from the plant are to be disposed of without entering the river runoff, then they must be planning a series of settling ponds or drain fields of rather large capacity since the only other avenue feasibly open to them for discharge of that water, through evaporation, can be expected to be effective for less than 20 percent of the water and only during the summer for that. The concern then is for ground-water quality maintenance and I see no analysis in your report to indicate that you are conducting such investigations.

Statement adequacy:

In total, your report is good for the areas of competency of simple static-model air pollution; but it in no way approaches adequacy for an impact statement in that it does not assess major areas of social and physical impact that one would expect for a true EIS. Since you are an Air Quality Bureau, why do you attempt to prepare an impact statement on matters other than air quality at all? In reality, is not your draft statement actually a rather good "Report on some air quality implications of the proposed Bonner plywood manufacturing plant"? My concern here is that you may be misleading the people of the state into thinking that an environmental impact analysis has been done on the Bonner Mill site when, in fact, only a partial analysis has been completed by your staff. Perhaps, the questions of water vapor, waste water, traffic, fog, social impacts, etc. are being investigated by other divisions of the State Department of Health and Environmental Sciences. I hope so. I would expect that your organization would then become well staffed in meteorological, social, planning, environmental geologic, and other expertise as necessary for conducting impact analyses. This is a big responsibility and is, I understand, being met with gross [illegible] funds and possibly with inadequate personnel in the state. However, there [illegible] expertise within this state available to your office and so long as the burden of p[illegible] is properly placed on the persons contemplating the change and applying for perm[illegible] feel that it should be possible for your office to oversee the preparation of m[illegible] adequate impact statements.

[illegible] comments may be taken in a spirit of willingness to help out and sympa[illegible] for the difficult situation you face. I know from considerable experience that [illegible] is much easier to criticize other's impact statements than to prepare them, but [illegible] so know that well-worded questions to U.S. Plywood-Champion International could have yielded more information that you have presented in your report.

Sincerely,

Robert R. Curry

Robert R. Curry
Associate Professor
Environmental Geology
243-5511

RRC/m[illegible]

Response to Comments of Robert R. Curry

The water vapor emission and concurrent possible adverse effects have been discussed in Section III, A, 4, III, B, 5, and III, C, 4. Discussion of waste water is found in III, C, 4.

The comments on statement adequacy underline an unfortunate situation. The Montana Environmental Quality Council guideline requires the preparation of environmental impact statements by the lead agency; i.e., that agency which has the primary decision making responsibility. No provisions have been made to allow such decisions to be affected by situations other than those regulated by the lead agency, yet many other factors are to be considered in an environmental impact statement. These factors, other than air pollution, have been considered in the environmental impact statement within the limits of time and resources available. While we recognize their inadequacy, the situation remains.

This Impact Statement was written by:

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